



# ***STIC Search Report***

**EIC 1700**

**STIC Database Tracking Number: 180878**

**TO: Ben Sackey**  
**Location: REM 5C18**  
**Art Unit : 1626**  
**March 8, 2006**

**Case Serial Number: 10/648572**

**From: Kathleen Fuller**  
**Location: EIC 1700**  
**REMSSEN 4B28**  
**Phone: 571/272-2505**  
**Kathleen.Fuller@uspto.gov**

## **Search Notes**

Scientific and Technical Information Center

## SEARCH REQUEST FORM

Requester's Full Name: BEN SACKET Examiner #: 73489 Date: 2/27/06  
 Art Unit: 1624 Phone Number: 2-0704 Serial Number: 10/648,572  
 Location (Bldg/Room#): REM 583/(Mailbox #): 5C18 Results Format Preferred (circle): PAPER DISK  
 \*\*\*\*\*

To ensure an efficient and quality search, please attach a copy of the cover sheet, claims, and abstract or fill out the following:

Title of Invention: Purification of ACN by distillative Recovery  
 Inventors (please provide full names): COSA et al.

SCIENTIFIC REFERENCE BR  
 Sci & Tech Inf - Cnt

Earliest Priority Date: \_\_\_\_\_

FEB 28 REC'D

## Search Topic:

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter **Pat. & TM. Office** Pat. searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known.

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

- A process for prep. highly purified acetonitrile having low levels of acetamide comprising:
- ① distilling crude acetonitrile in a first distillation column affixed with a first overhead reflux loop at a pressure of 1 atm to remove HCN, producing 1st ACN/H<sub>2</sub>O azeotrope and a 1st bottom product containing H<sub>2</sub>O
  - ② distilling 1st azeotrope in a 2nd distillation column etc.
  - ③ distilling 2nd azeotrope etc.
  - ④ passing the highly pure ACN stream through an acidic ion exchange resin for further purification.

Thanks

## STAFF USE ONLY

Searcher: K. Fuller

Searcher Phone #: \_\_\_\_\_

Searcher Location: \_\_\_\_\_

Date Searcher Picked Up: \_\_\_\_\_

Date Completed: 3/8/06

Searcher Prep & Review Time: 30

Online Time: 129

## Type of Search

\_\_\_\_ NA Sequence (#)

\_\_\_\_ AA Sequence (#)

\_\_\_\_ Structure (#)

\_\_\_\_ Bibliographic

\_\_\_\_ Litigation

\_\_\_\_ Fulltext

\_\_\_\_ Other

## Vendors and cost where applicable

✓ STN 396 \_\_\_\_\_ Dialog

\_\_\_\_ Questel/Orbit \_\_\_\_\_ Lexis/Nexis

\_\_\_\_ Westlaw \_\_\_\_\_ WWW/Internet

\_\_\_\_ In-house sequence systems

\_\_\_\_ Commercial \_\_\_\_\_ Oligomer \_\_\_\_\_ Score/Length

\_\_\_\_ Interference \_\_\_\_\_ SPDI \_\_\_\_\_ Encode/Transl

\_\_\_\_ Other (specify)

=> file reg

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
10.12	48.57

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
0.00	-0.75

CA SUBSCRIBER PRICE

FILE 'REGISTRY' ENTERED AT 13:35:19 ON 08 MAR 2006

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Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 7 MAR 2006 HIGHEST RN 876109-17-0

DICTIONARY FILE UPDATES: 7 MAR 2006 HIGHEST RN 876109-17-0

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH January 6, 2006

Please note that search-term pricing does apply when conducting SmartSELECT searches.

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 \* The CA roles and document type information have been removed from \*  
 \* the IDE default display format and the ED field has been added, \*  
 \* effective March 20, 2005. A new display format, IDERL, is now \*  
 \* available and contains the CA role and document type information. \*  
 \*  
 \*\*\*\*\*

Structure search iteration limits have been increased. See HELP SLIMITS for details.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/regprops.html>

=> file hcaplu

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
0.44	49.01

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
0.00	-0.75

CA SUBSCRIBER PRICE

FILE 'HCAPLUS' ENTERED AT 13:35:24 ON 08 MAR 2006

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FILE COVERS 1907 - 8 Mar 2006 VOL 144 ISS 11  
FILE LAST UPDATED: 7 Mar 2006 (20060307/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que

L3 1 SEA FILE=REGISTRY ABB=ON 75-05-8  
L4 35132 SEA FILE=HCAPLUS ABB=ON L3  
L5 132 SEA FILE=HCAPLUS ABB=ON L4 (L) PUR/RL  
L6 68 SEA FILE=HCAPLUS ABB=ON L5 AND DISTILL?  
L7 20 SEA FILE=HCAPLUS ABB=ON L6 AND AZEOTROP?

=> d 17 bib abs ind hitstr 1-20

L7 ANSWER 1 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 2005:1042734 HCAPLUS  
DN 143:308283  
TI Feasibility study of heterogeneous batch extractive distillation  
AU Rodriguez-Donis, Ivonne; Varga, Viktoria; Gerbaud, Vincent; Lelkes, Zoltan; Rev, Endre; Fonyo, Zsolt; Joulia, Xavier  
CS Centro de Quimica Farmaceutica, Playa, 16042, Cuba  
SO Computer-Aided Chemical Engineering (2005), 20A (European Symposium on Computer-Aided Process Engineering-15, 2005, Part A), 895-900  
CODEN: CACEFH  
PB Elsevier B.V.  
DT Journal  
LA English  
AB Feasibility of batch heterogeneous extractive distillation is studied in the case where the heterogeneous azeotrope formed with the entrainer is not the most volatile point in the system. The composition profile maps based feasibility methodol. is extended to this case, and demonstrated on the test problem of separating water from acetonitrile with Bu acetate as entrainer. Whether the process is anyhow feasible and if one or two column sections are needed for feasible separation were questions answered by the feasibility study. The appropriate operation steps (i.e. the separation sequence) and the effect of the feed ratio and reflux ratio on the feasibility are also determined according to the short-cut calculated profile maps. The results are verified by rigorous computation with ProsimBatch.  
CC 48-1 (Unit Operations and Processes)  
ST batch extractive distn feasibility analysis  
IT Distillation  
(extractive, batch; feasibility anal. of heterogeneous batch extractive distillation)  
IT 123-86-4, Butyl acetate  
RL: NUU (Other use, unclassified); USES (Uses)

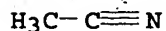
(feasibility anal. of heterogeneous batch extractive distillation)  
 IT 75-05-8P, Acetonitrile, processes 7732-18-5P, Water, processes  
 RL: PUR (Purification or recovery); REM (Removal or disposal);  
 PREP (Preparation); PROC (Process)  
 (feasibility anal. of heterogeneous batch extractive distillation)  
 IT 75-05-8P; Acetonitrile, processes  
 RL: PUR (Purification or recovery); REM (Removal or disposal);  
 PREP (Preparation); PROC (Process)  
 (feasibility anal. of heterogeneous batch extractive distillation)  
 RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 2 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:1042710 HCAPLUS  
 DN 143:308277  
 TI Homogeneous azeotropic pressure swing distillation:  
 Continuous and batch process  
 AU Repke, Jens-Uwe; Klein, Andreas  
 CS Institute of Plant and Technology, Berlin, 10625, Germany  
 SO Computer-Aided Chemical Engineering (2005), 20A(European Symposium on  
 Computer-Aided Process Engineering-15, 2005, Part A), 721-726  
 CODEN: CACEFH  
 PB Elsevier B.V.  
 DT Journal  
 LA English  
 AB The separation of a binary homogeneous azeotropic mixture by using  
 pressure swing distillation is analyzed on the example of  
 acetonitrile/water. Two different processes are considered: the  
 continuous heat- and mass-integrated process and the inverted batch  
 process. For both processes a model is developed and exptl. data are  
 given. In the paper the potential of the pressure swing distillation  
 for the separation of binary homogeneous azeotropic mixts. is  
 demonstrated, in particular the process performance is investigated and  
 application aspects for the continuous and the inverted batch process are  
 discussed.  
 CC 48-1 (Unit Operations and Processes)  
 ST homogeneous azeotropic pressure swing distn  
 IT Azeotropes  
 (anal. of homogeneous azeotropic pressure swing continuous  
 and batch distillation)  
 IT Distillation  
 (azeotropic; anal. of homogeneous azeotropic  
 pressure swing continuous and batch distillation)  
 IT 75-05-8P; Acetonitrile, processes 7732-18-5P, Water, processes  
 RL: PUR (Purification or recovery); REM (Removal or disposal);  
 PREP (Preparation); PROC (Process)  
 (anal. of homogeneous azeotropic pressure swing continuous  
 and batch distillation)  
 IT 75-05-8P, Acetonitrile, processes  
 RL: PUR (Purification or recovery); REM (Removal or disposal);  
 PREP (Preparation); PROC (Process)  
 (anal. of homogeneous azeotropic pressure swing continuous  
 and batch distillation)

RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 3 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 2005:559705 HCAPLUS  
DN 143:250237  
TI Separation of homogeneous azeotropic mixtures by mixed-pressure rectification. An analysis of the operating behavior  
AU Repke, Jens-Uwe; Forner, Florian; Klein, Andreas  
CS Institut fuer Prozess- und Analagentchnik, Fachgebiet Dynamik und Betriebstechnischer Anlagen, TU-Berlin, Berlin, D-10623, Germany  
SO Chemie Ingenieur Technik (2005), 77(6), 763-771  
CODEN: CITEAH; ISSN: 0009-286X  
PB Wiley-VCH Verlag GmbH & Co. KGaA  
DT Journal  
LA German  
AB Based on an exptl. validated, rigorous model, the complex behavior of the mixed-pressure rectification process for the separation of homogeneous azeotropic mixts. was analyzed. The system MeCN/H2O serves as the model system. Two control concepts were developed for the mixed-pressure rectification columns. One of them comprises the complete integration of the energy. The efficiency of these control concepts was tested concerning variations in the feed concentration  
CC 48-1 (Unit Operations and Processes)  
ST rectification mixed pressure azeotrope acetonitrile water process control  
IT Distillation  
(azeotropic; mixed-pressure rectification process for separation of homogeneous azeotropic mixts.)  
IT Process control  
(mixed-pressure rectification process for separation of homogeneous azeotropic mixts.)  
IT 75-05-8P, Acetonitrile, processes 7732-18-5P, Water, processes  
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); PREP (Preparation); PROC (Process)  
(mixed-pressure rectification process for separation of homogeneous azeotropic mixts.)  
IT 75-05-8P, Acetonitrile, processes  
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); PREP (Preparation); PROC (Process)  
(mixed-pressure rectification process for separation of homogeneous azeotropic mixts.)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 4 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2005:426565 HCAPLUS  
 DN 142:465439  
 TI Acetonitrile recycling process using **distillation**  
 IN Van Gysel, August; Soeterbroeck, Frans; Vermeulen, Geert  
 PA UCB, S.A., Belg.  
 SO PCT Int. Appl.; 28 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2005044783	A2	20050519	WO 2004-EP12167	20041028
	WO 2005044783	A3	20050811		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

PRAI EP 2003-25184 A 20031104

AB A process for purifying an acetonitrile feedstock comprising acetonitrile, 16-90% water, low-boiling impurities having a boiling temperature lower than the acetonitrile-water **azeotrope** b.p., and high-boiling impurities having a boiling temperature higher than the acetonitrile b.p., comprises: (A) introducing the feedstock into a **distillation** column and, by performing a **distillation**, separating the acetonitrile-water **azeotrope** and the low-boiling impurities from the high-boiling impurities, the acetonitrile-water **azeotrope** and the low-boiling impurities being drawn as a vapor from the top of the **distillation** column, the high-boiling impurities being produced as the **distillation** column bottoms; (B) feeding the acetonitrile-water **azeotrope** and the low-boiling impurities to a pervaporation unit capable of separating the water from the acetonitrile, the majority of water being collected as a permeate from the pervaporation unit, and the acetonitrile, low-boiling impurities and remaining water being collected as a retentate; (C) introducing the retentate of the pervaporation unit into a **distn** column and, by performing another **distillation**, withdrawing the remaining acetonitrile-water **azeotrope** and the low-boiling impurities as a vapor, where the acetonitrile is recovered from the **distillation** column bottoms. Process flow diagrams are presented.

IC ICM C07C253-00

ICS C07C253-34; C07C255-03; B01D061-36

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 48

ST acetonitrile water sepn purifn **distn**

IT Pervaporation

(acetonitrile recycling process using **distillation** and)

IT Nitriles, preparation

RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); PREP (Preparation); PROC (Process)

(acetonitrile; acetonitrile recycling process using **distillation**)

IT Distillation  
(azeotropic; acetonitrile recycling process using distillation)

IT Distillation apparatus  
Distillation columns  
(in an acetonitrile recycling process using distillation)

IT 75-05-8P, Acetonitrile, preparation  
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); PREP (Preparation); PROC (Process)  
(acetonitrile recycling process using distillation)

IT 7732-18-5, Water, processes  
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PYP (Physical process); REM (Removal or disposal); PROC (Process)  
(acetonitrile recycling process using distillation)

IT 7440-44-0, Activated carbon, processes  
RL: EPR (Engineering process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(activated, adsorbent; acetonitrile recycling process using distillation and)

IT 75-05-8P, Acetonitrile, preparation  
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); PREP (Preparation); PROC (Process)  
(acetonitrile recycling process using distillation)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L7 ANSWER 5 OF 20 HCAPLUS. COPYRIGHT 2006 ACS on STN

AN 2004:887311 HCAPLUS

DN 142:96582

TI A new combination process of distillation with salt extraction for separating organic solvent-water azeotropes

AU Pan, Xiaomei; Xiao, Guomin; Yang, Zhicai

CS Dep. of Chem. and Chem. Eng., Southeast Univ., Nanjing, 210096, Peop. Rep. China

SO Journal of Southeast University (English Edition) (2004), 20(2), 226-228  
CODEN: JSUOAT; ISSN: 1003-7985

PB Journal of Southeast University

DT Journal

LA English

AB A novel process which can purify the organic solvents from their azeotropes with water is proposed. In this process, water can be drained off both from bottom and overhead of tower at the same time, and the organic solvent is concentrated in the tower and accumulated in the middle vessel at last. The progress is time-shortened and energy-saving. The product purity is 99.8% and the product yield is more than 99.5%. Simulation of liquid-liquid equilibrium (LLE) and the equipment operation data agree well with the experiment

CC 48-1 (Unit Operations and Processes)  
Section cross-reference(s): 80

ST distn salt extn org solvent water azeotrope

IT Distillation  
(batch; combination process of distillation with salt extraction for



purify organic solvents from their azeotropes with water)

IT Extraction  
(combination process of distillation with salt extraction for purify organic solvents from their azeotropes with water)

IT Solvents  
(organic; combination process of distillation with salt extraction for purify organic solvents from their azeotropes with water)

IT 10043-52-4, Calcium chloride, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(combination process of distillation with salt extraction for purify organic solvents from their azeotropes with water)

IT 75-05-8P, Acetonitrile, preparation 7732-18-5P, Water, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(combination process of distillation with salt extraction for purify organic solvents from their azeotropes with water)

IT 75-05-8P, Acetonitrile, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(combination process of distillation with salt extraction for purify organic solvents from their azeotropes with water)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 6 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2004:741088 HCAPLUS

DN 141:245398

TI Homogeneous azeotropic distillation in an energy- and mass-integrated pressure swing column system

AU Repke, Jens-Uwe; Klein, Andreas; Forner, Florian

CS Institute of Process and Plant Technology, TU Berlin, Berlin, 10623, Germany

SO Computer-Aided Chemical Engineering (2004), 18(European Symposium on Computer-Aided Process Engineering-14, 2004), 757-762  
CODEN: CACEFH

PB Elsevier B.V.

DT Journal

LA English

AB The separation of a homogeneous azeotropic mixture using the pressure swing distillation process is insufficiently researched and therefore industrial applications are limited. The process performance of a heat- and mass-integrated pressure swing distillation column system to sep. an acetonitrile/water mixture is analyzed in the scope of this paper. Different control structures are developed and compared by using a rigorous dynamic model written in gProms. The disturbance performance of the process is analyzed especially for changes in feed concentration and feed flow rate. Remarkable is the robust process operability by changes of the feed concentration from one distillation region to the other region. The robust process performance of the pressure swing distillation column system relative to feed disturbance is demonstrated.

CC 48-1 (Unit Operations and Processes)

ST homogeneous azeotropic pressure swing distn energy mass integration

IT Distillation

(azeotropic; homogeneous azeotropic distn  
 . in energy- and mass-integrated pressure swing column system)

IT 75-05-8P, Acetonitrile, preparation 7732-18-5P, Water,  
 preparation  
 RL: PUR (Purification or recovery); PREP (Preparation)  
 (homogeneous azeotropic distillation in energy- and  
 mass-integrated pressure swing column system)

IT 75-05-8P, Acetonitrile, preparation  
 RL: PUR (Purification or recovery); PREP (Preparation)  
 (homogeneous azeotropic distillation in energy- and  
 mass-integrated pressure swing column system)

RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

$\text{H}_3\text{C}-\text{C}\equiv\text{N}$

RE: CNT 5. THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 7 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2004:324173 HCAPLUS  
 DN 141:159252  
 TI Method for separation of low melting point organic solvent  
 azeotrope containing excess water  
 IN Cui, Xianbao; Yang, Zhicai  
 PA Tianjin University, Peop. Rep. China  
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 5 pp.  
 CODEN: CNXXEV

DT Patent  
 LA Chinese

FAN. CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI CN 1391971	A	20030122	CN 2002-121371	20020618
PRAI CN 2002-121371		20020618		
AB	The method comprises batch feeding the azeotrope (e.g., acetonitrile-water azeotrope) to an intermediate storage tank, supplying the azeotrope from the storage tank to a rectification column, returning the reflux fluid to the storage tank, supplying the condensed liquid from the top of the rectification column to a phase separator with an additive (e.g., 0-95% solution of CaCl, KCl, or KAc), refluxing the upper or lower layer organic phase liquid to the rectification column and feeding the water phase liquid to an evaporator, supplying the gas phase components of the evaporator to a recovery column and the concentrated additive solution to an additive tank, returning the azeotrope from the top of the recovery column to the phase separator and discharging the separated water, and discharging the wastewater from the bottom of the rectification column.			
IC	ICM B01D003-14			
CC	48-1 (Unit Operations and Processes)			
ST	org solvent azeotrope sepn rectification phase sepn evapn			
IT	Azeotropes (binary; method for separation of low m.p. organic solvent azeotrope containing excess water)			
IT	Distillation Evaporation Phase separation (method for separation of low m.p. organic solvent azeotrope containing			

excess water)  
 IT Solvents  
   (organic; method for separation of low m.p. organic solvent azeotrope containing excess water)  
 IT 127-08-2, Potassium acetate 7447-40-7, Potassium chloride, uses 10043-52-4, Calcium chloride, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
   (method for separation of low m.p. organic solvent azeotrope containing excess water)  
 IT 75-05-8P, Acetonitrile, preparation  
 RL: PUR (Purification or recovery); PREP (Preparation)  
   (method for separation of low m.p. organic solvent azeotrope containing excess water)  
 IT 75-05-8P, Acetonitrile, preparation  
 RL: PUR (Purification or recovery); PREP (Preparation)  
   (method for separation of low m.p. organic solvent azeotrope containing excess water)  
 RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

$\text{H}_3\text{C}-\text{C}\equiv\text{N}$

L7 ANSWER 8 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 2003:919076 HCAPLUS  
 DN 141:56068  
 TI Method for refining and recovering acetonitrile  
 IN Wang, Yu; Sun, Bingting; Tai, Chengzhe; Wu, Jiming; Wang, Zhenzhong  
 PA Huake Group Co., Ltd., Peop. Rep. China  
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 5 pp.  
 CODEN: CNXXEV  
 DT Patent  
 LA Chinese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1389456	A	20030108	CN 2001-118463	20010531
PRAI	CN 2001-118463		20010531		

AB The method comprises distilling an acetonitrile wastewater (a byproduct from production of acrylonitrile by ammoxidn. of propylene) at 0.07-0.09 MPa in a decyanation tower while controlling the temperature at top of the tower at 60-70° and collecting light components (composed of HCN, acrylonitrile, acetone, and acrolein) from top of the tower and acetonitrile azeotrope from a medium-lower part of the tower; reacting the acetonitrile azeotrope while distilling to obtain a second azeotrope; and extraction distilling with desalted water as extractant (10-20%) at 0.015-0.045 MPa in a dewatering tower while controlling reflux ratio at 2.2-2.6.

IC ICM C07C255-03  
 ICS C07C253-34

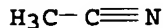
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
 ST acetonitrile wastewater recovery extn distn  
 IT Distillation

(extractive; method for refining and recovering acetonitrile)  
 IT 75-05-8P, Acetonitrile, preparation  
 RL: PUR (Purification or recovery); PREP (Preparation)  
   (method for refining and recovering acetonitrile)  
 IT 75-05-8P, Acetonitrile, preparation

RL: PUR (Purification or recovery); PREP (Preparation)  
(method for refining and recovering acetonitrile)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L7 ANSWER 9 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2001:817319 HCAPLUS

DN 136:87436

TI Development and application of a process for high purity acetonitrile

AU Li, Zhong-jie

CS Research and Development Department, Qilu Petrochemical Corp., Zibo,  
Shandong, 255408, Peop. Rep. China

SO Shiyu Huagong (2001), 30(10), 785-788

CODEN: SHHUE8; ISSN: 1000-8144

PB Shiyu Huagong Bianjibu

DT Journal; General Review

LA Chinese

AB A review with refs. on propylene-ammoxidn. process that produces  
acrylonitrile with acetonitrile as byproduct. The new process employs  
technologies of HCN-removal, treatment with NaOH, and combined  
azeotropic distillation under pressure and reduced pressure to  
overcome the problems of low purity and low yield of acetonitrile and  
produce acetonitrile with a purity of over 99.9%, with a recycling rate of  
product of over 90%, so that the economic benefits increases greatly.

CC 45-0 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

ST review acetonitrile purifn

IT 75-05-8, Acetonitrile, preparation

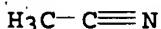
RL: PUR (Purification or recovery); PREP (Preparation)  
(process for high purity acetonitrile)

IT 75-05-8, Acetonitrile, preparation

RL: PUR (Purification or recovery); PREP (Preparation)  
(process for high purity acetonitrile)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L7 ANSWER 10 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:557714 HCAPLUS

DN 131:159150

TI Distillation process for the purification and recovery of  
HPLC-grade acetonitrile

IN Godbole, Sanjay Purushottam; Wappelhorst, Richard Lee; Jacobson, Paul Alan  
PA Standard Oil Co., USA

SO Eur. Pat. Appl., 8 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	EP 937707	A2	19990825	EP 1999-300757	19990202

EP 937707 A3 20000726  
EP 937707 B1 20030416  
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
IE, SI, LT, LV, FI, RO  
ES 2197578 T3 20040101 ES 1999-300757 19990202  
BR 9900414 A 20000502 BR 1999-414 19990212  
MX 9901644 A 20000228 MX 1999-1644 19990218  
ZA 9901401 A 19990823 ZA 1999-1401 19990222  
CN 1231282 A 19991013 CN 1999-103325 19990222  
CN 1131205 B 20031217  
JP 11286473 A2 19991019 JP 1999-43849 19990222  
TW 422830 B 20010221 TW 1999-88102558 19990222  
RU 2230733 C2 20040620 RU 1999-103632 19990222  
BG 64552 B1 20050729 BG 1999-103188 19990222  
US 6326508 B1 20011204 US 2000-654631 20000905  
PRAI US 1998-27864 A 19980223  
AB The title process comprises feeding crude acetonitrile (containing acrylonitrile as an impurity) and water into the upper portion of a distillation column, distilling the crude acetonitrile in the presence of the water to vaporize the acrylonitrile in the presence of the water, removing the acrylonitrile in an overhead stream exiting from the distillation column, and recovering the crude acetonitrile, substantially free of acrylonitrile, from the lower portion of the distillation column; a process flow diagram is presented. This method can be used to produce HPLC-grade acetonitrile having a UV cutoff <190 nm.  
IC ICM C07C253-34  
ICS C07C255-03  
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 23, 48  
ST acetonitrile purifn azeotropic distn; acrylonitrile impurity removal acetonitrile purifn  
IT Cation exchangers  
(acidic; in a distillation process for the purification and recovery of HPLC-grade acetonitrile)  
IT Distillation  
(azeotropic; distillation process for the purification and recovery of HPLC-grade acetonitrile)  
IT Purification  
(distillation process for the purification and recovery of HPLC-grade acetonitrile)  
IT Distillation columns  
(purification and recovery of HPLC-grade acetonitrile using)  
IT Distillation  
(secondary; distillation process for the purification and recovery of HPLC-grade acetonitrile)  
IT 7732-18-5, Water, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(distillation process for the purification and recovery of HPLC-grade acetonitrile)  
IT 75-05-8P, Acetonitrile, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(distillation process for the purification and recovery of HPLC-grade acetonitrile)  
IT 74-90-8, Hydrogen cyanide, processes 107-13-1, 2-Propenenitrile, processes  
RL: REM (Removal or disposal); PROC (Process)  
(distillation process for the purification and recovery of HPLC-grade acetonitrile)  
IT 75-05-8P, Acetonitrile, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)

(distillation process for the purification and recovery of HPLC-grade acetonitrile)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L7 ANSWER 11 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:387717 HCAPLUS

DN 131:31726

TI Preparation of hexafluoropropylene dimer, separation of it from acetonitrile, and their azeotropic composition

IN Aoyama, Hirokazu; Tabuchi, Shoichi

PA Daikin Industries, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 10 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11158091	A2	19990615	JP 1998-266559	19980921
	US 6242410	B1	20010605	US 1998-160038	19980925
PRAI	JP 1997-263933	A	19970929		

OS CASREACT 131:31726

AB In separation of (CF<sub>3</sub>)<sub>2</sub>CFCF:CFCF<sub>3</sub> and/or (CF<sub>3</sub>)<sub>2</sub>C:CFCF<sub>2</sub>CF<sub>3</sub> or AcCN from their mixts., the separation method comprise **distillation** step of the mixts. to produce **azeotropic** compns. composed of (CF<sub>3</sub>)<sub>2</sub>CFCF:CFCF<sub>3</sub> and/or (CF<sub>3</sub>)<sub>2</sub>C:CFCF<sub>2</sub>CF<sub>3</sub> and AcCN. In preparation of hexafluoropropylene dimer with AcCN solvent, hexafluoropropylene dimer containing AcCN obtained by liquid-liquid separation of the reaction mixture is **distilled** to produce their **azeotropic** compns. and production of bottoms comprising hexafluoropropylene dimer without AcCN. Hexafluoropropylene was dimerized in the presence of KF in AcCN at 25° under 2.2 kg/cm<sup>2</sup> for 140 min to give a reaction mixture having two liquid phase, whose lower phase containing hexafluoropropylene dimer in which 9.0% AcCN was dissolved was **distilled** to give hexafluoropropylene dimer-AcCN **azeotropic** mixture as the first fraction and hexafluoropropylene dimer containing ≤0.001% AcCN as main fraction.

IC ICM C07C021-18

ICS C07C017-386; C07C253-34; C07C255-03

CC 23-3 (Aliphatic Compounds)

ST **azeotropic** compn fluoropropylene dimer acetonitrile; fluoropropylene dimer sepn **distn** acetonitrileIT **Azeotropes**

Purification

(preparation of hexafluoropropylene and separation of it from acetonitrile by **distillation** to remove acetonitrile as their **azeotropic** composition)

IT 7789-23-3, Potassium fluoride (KF)

RL: CAT (Catalyst use); USES (Uses)

(preparation of hexafluoropropylene and separation of it from acetonitrile by **distillation** to remove acetonitrile as their **azeotropic** composition)

IT 75-05-8P, Acetonitrile, preparation

RL: NUU (Other use, unclassified); PUR (Purification or recovery)

; REM (Removal or disposal); PREP (Preparation); PROC (Process); USES

## (Uses)

(preparation of hexafluoropropylene and separation of it from acetonitrile by **distillation** to remove acetonitrile as their **azeotropic composition**)

IT 1584-03-8P 2070-70-4P

RL: PUR (Purification or recovery); PREP (Preparation)

(preparation of hexafluoropropylene and separation of it from acetonitrile by **distillation** to remove acetonitrile as their **azeotropic composition**)

IT 13429-24-8P, Hexafluoropropylene dimer

RL: PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)

(preparation of hexafluoropropylene and separation of it from acetonitrile by **distillation** to remove acetonitrile as their **azeotropic composition**)

IT 116-15-4, Hexafluoropropylene

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of hexafluoropropylene and separation of it from acetonitrile by **distillation** to remove acetonitrile as their **azeotropic composition**)

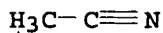
IT 75-05-8P, Acetonitrile, preparation

RL: NUU (Other use, unclassified); PUR (Purification or recovery); REM (Removal or disposal); PREP (Preparation); PROC (Process); USES (Uses)

(preparation of hexafluoropropylene and separation of it from acetonitrile by **distillation** to remove acetonitrile as their **azeotropic composition**)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L7 ANSWER 12 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1999:61157 HCAPLUS

DN 130:97171

TI Purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process

IN Cesa, Mark Clark; Wappelhorst, Richard Lee; Jacobson, Paul Alan

PA The Standard Oil Company, USA

SO Eur. Pat. Appl., 10 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 890572	A1	19990113	EP 1997-304974	19970708
	EP 890572	B1	20011031		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	ZA 9706067	A	19980323	ZA 1997-6067	19970708
	ES 2166952	T3	20020501	ES 1997-304974	19970708
	JP 11035542	A2	19990209	JP 1997-183750	19970709
	BR 9704256	A	19990309	BR 1997-4256	19970804
	CN 1207385	A	19990210	CN 1997-117193	19970805
	CN 1105099	B	20030409		
	TW 402583	B	20000821	TW 1997-86111678	19970814

*applicants*

US 2004176631 A1 20040909 US 2003-648572 20030826  
 PRAI US 1996-632382 A 19960410  
 EP 1997-304974 A 19970708

AB HPLC-grade acetonitrile (UV cutoff <190 nm) is prepared from crude ammoxidn.-produced acetonitrile, or from crude acetonitrile produced as a byproduct in acrylonitrile manufacture, by subjecting the crude acetonitrile to a multistep distillation (i.e., azeotropic distillation) under reflux conditions followed by treatment with acidic cation-exchange resin to remove essentially all impurities from the acetonitrile. A process flow diagram is presented.

IC ICM C07C253-34

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
 Section cross-reference(s): 23, 48

ST acetonitrile purifn **azeotropic distn**; cation exchanger  
 treatment purifn acetonitrile

IT Cation exchangers  
 (acidic; purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT **Distillation**  
 (azeotropic; of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT **Distillation**  
 (of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT Purification  
 (purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT Carboxyl group  
 (surface, cation-exchange resins containing; purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT 7732-18-5, Water, processes  
 RL: NUU (Other use, unclassified); REM (Removal or disposal); PROC (Process); USES (Uses)  
 (purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT 75-05-8P, Acetonitrile, preparation  
 RL: PUR (Purification or recovery); PREP (Preparation)  
 (purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT 64-18-6D, Formic acid, carboxylated cation-exchange resin derivs., reactions 7664-93-9D, Sulfuric acid, cation-exchange resin derivs., reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT 60-35-5, Acetamide, processes 74-90-8, Hydrogen cyanide, processes 107-13-1, Acrylonitrile, processes 288-42-6, Oxazole  
 RL: REM (Removal or disposal); PROC (Process)  
 (purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

IT 75-05-8P, Acetonitrile, preparation  
 RL: PUR (Purification or recovery); PREP (Preparation)  
 (purification of acetonitrile by a **distillative** recovery-acidic cation exchange resin treatment process)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



$$\text{H}_3\text{C}-\text{C}\equiv\text{N}$$

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 13 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1997:547240 HCAPLUS

DN 127:150403

TI Azeotropic method for recovery of acetonitrile and ethyl acetate  
or isopropanol from waste solvents containing them

IN Kishimoto, Akira; Nakane, Kazuhiro; Haneda, Hidetoshi; Iida, Shigeo

PA Sanwa Yuka Kogyo K. K., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09169715	A2	19970630	JP 1995-333118	19951221
	JP 2887103	B2	19990426		
PRAI	JP 1995-333118		19951221		
AB	In the title method, n-hexane is used as the azeotropic agent which is effectively workable in a solvent mixture containing 10-100 parts acetonitrile per 100 parts Et acetate or 50-200 parts acetonitrile per 100 parts isopropanol.				
IC	ICM C07C255-08 ICS B01D003-36; C07C067-54; C07C069-14; C07C253-34				
CC	45-5 (Industrial Organic Chemicals, Leather, Fats, and Waxes)				
ST	azeotropic distn waste solvent recovery; ethyl acetate recovery azeotropic distn; acetonitrile waste solvent recovery azeotropic; isopropanol waste solvent recovery azeotropic; hexane azeotropic agent solvent recovery				
IT	Distillation (azeotropic method for recovery of acetonitrile and Et acetate or isopropanol from waste solvents containing them)				
IT	Wastes Wastes (solvents; azeotropic method for recovery of acetonitrile and Et acetate or isopropanol from waste solvents containing them)				
IT	Solvents Solvents (waste; azeotropic method for recovery of acetonitrile and Et acetate or isopropanol from waste solvents containing them)				
IT	110-54-3, n-Hexane, uses RL: NUU (Other use, unclassified); USES (Uses) (azeotropic method for recovery of acetonitrile and Et acetate or isopropanol from waste solvents containing them)				
IT	67-63-0P, Isopropanol, preparation 75-05-8P, Acetonitrile, preparation 141-78-6P, Ethyl acetate, preparation RL: PUR (Purification or recovery); PREP (Preparation) (azeotropic method for recovery of acetonitrile and Et acetate or isopropanol from waste solvents containing them)				
IT	75-05-8P, Acetonitrile, preparation RL: PUR (Purification or recovery); PREP (Preparation) (azeotropic method for recovery of acetonitrile and Et acetate or isopropanol from waste solvents containing them)				
RN	75-05-8 HCAPLUS				

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

 $\text{H}_3\text{C}-\text{C}\equiv\text{N}$ 

L7 ANSWER 14 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1984:594113 HCAPLUS  
DN 101:194113  
TI Preliminary development of an acetonitrile purifier  
AU Hernandez M., Rene; De la Guardia M., Patricia  
CS IMP, Mex.  
SO Revista del Instituto Mexicano del Petroleo (1983), 15(4), 73-9  
CODEN: RVMPAX; ISSN: 0538-1428  
DT Journal  
LA Spanish  
AB Exptl. data on the cumene (I) [98-82-8]-MeCN [75-05-8]-water liquid-liquid system are given at 20, 35, and 50° in order to develop a process for the purification of MeCN from its azeotropic mixts. with water using I as a solvent. The process enables a 99% pure product to be obtained from crude MeCN with low solvent consumption and fewer operational (distillation) problems.  
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 48  
ST acetonitrile purifn cumene solvent extn  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of, by solvent extraction with cumene-water mixture)  
IT 98-82-8  
RL: USES (Uses)  
(solvents, in extraction-purification of acetonitrile)  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of, by solvent extraction with cumene-water mixture)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

 $\text{H}_3\text{C}-\text{C}\equiv\text{N}$ 

L7 ANSWER 15 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1981:208395 HCAPLUS  
DN 94:208395  
TI Purification of acetonitrile  
IN Mittenhuber, Karl; Nier, Hans Joachim; Marschner, Rolf; Wolf, Juergen; Hanse, Ursula; Lange, Renate  
PA Ger. Dem. Rep.  
SO Ger. (East), 7 pp.  
CODEN: GEXXA8  
DT Patent  
LA German  
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DD 144765	Z	19801105	DD 1979-214160	19790706
PRAI DD 1979-214160	A1	19790706		

AB MeCN was purified by azeotropic distillation in the presence

of an amine, especially HOCH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>. Thus, MeCN containing 2600 ppm acrylonitrile was azeotroped 6 h with 3% HOCH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub> at 358° K to give a product containing 18 ppm acrylonitrile.

IC C07C121-18  
CC 23-19 (Aliphatic Compounds)  
ST acetonitrile purifn; nitrile purifn  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of)  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L7 ANSWER 16 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1980:585719 HCAPLUS  
DN 93:185719  
TI Purification of acetonitrile  
AU Kieseles, Herbert  
CS Fak. Chem., Univ. Konstanz, Konstanz, D-7750, Fed. Rep. Ger.  
SO Analytical Chemistry (1980), 52(13), 2230-2  
CODEN: ANCHAM; ISSN: 0003-2700  
DT Journal  
LA English  
AB A 4-step purification method for MeCN is described, comprising azeotropic distillation with MeOH, distillation from NaH, filtration over acidic Al<sub>2</sub>O<sub>3</sub>, and distillation from CaH<sub>2</sub>. The tech. grade starting material contains Me<sub>2</sub>CO (810 ppm), NCCH:CH<sub>2</sub> (240 ppm), HOCH<sub>2</sub>CH:CH (2620 ppm), benzene (180 ppm), EtCN (320 ppm), and water (1680 ppm). The purified product, obtained in 60% overall yield, shows EtCN (250 ppm) and water (1 ppm) as sole detectable impurities. The water content may be reduced below the detection limit of 0.2 ppm (coulometric Karl-Fischer titration) by addnl. filtration over Al<sub>2</sub>O<sub>3</sub> in a closed system. The final product is checked by gas chromatog., photometry (95-100% transmittance at 200 nm, 1 cm, reference water), and single sweep voltammetry (potential window from +2.70 V to -3.30 V vs. Ag/0.01 M Ag+).  
CC 23-19 (Aliphatic Compounds)  
ST acetonitrile purifn  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of)  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L7 ANSWER 17 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1975:605793 HCAPLUS

DN 83:205793  
TI Acetonitrile purification  
IN Marschner, Rolf; Wolf, Juergen; Dobberstein, Lutz  
PA Ger. Dem. Rep.  
SO Ger. (East), 3 pp. Addn. to Ger. (East) 106,638.  
CODEN: GEXXA8  
DT Patent  
LA German  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DD 110489	Y	19741220	DD 1973-175089	19731203
PRAI	DD 1973-175089	A1	19731203		
AB	A mixture containing MeCN 82.2, CH <sub>2</sub> :CHCN 1, H <sub>2</sub> O 15, EtCN 1, CN- 0.7%, and acetone 300 ppm was dried by azeotropic distillation with CH <sub>2</sub> :CHCN, treated with alkali hydroxide, and distilled through a 40-60-plate column to give MeCN containing <0.1% H <sub>2</sub> O, <100 ppm CH <sub>2</sub> :CHCN, <10 ppm HCN, and <500 ppm EtCN.				
IC	C07C				
CC	23-19 (Aliphatic Compounds)				
ST	acetonitrile purifn				
IT	75-05-8P, preparation				
	RL: PUR (Purification or recovery); PREP (Preparation)				
	(purification of)				
IT	75-05-8P, preparation				
	RL: PUR (Purification or recovery); PREP (Preparation)				
	(purification of)				
RN	75-05-8 HCAPLUS				
CN	Acetonitrile (8CI, 9CI) (CA INDEX NAME)				

H<sub>3</sub>C-C≡N

L7 ANSWER 18 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1975:97701 HCAPLUS

DN 82:97701

TI Purification of acetonitrile

IN Sichtig, Harald; Herrmann, Klaus; Marschner, Rolf; Schuetze, Winfried

SO Ger. (East), 3 pp.

CODEN: GEXXA8

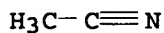
DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DD 106638	Z	19740620	DD 1973-169884	19730402
PRAI	DD 1973-169884	A1	19730402		
AB	A mixture containing MeCN 79.25, H <sub>2</sub> O 12.84, acrylonitrile (I) 5.47, and high-boiling impurities (II) 1.68% was distilled through a selective distillation column which removed H <sub>2</sub> O by azeotropization to give a mixture containing MeCN 95.100, I 2.300, II 2.600, and H <sub>2</sub> O 0.025%. This mixture was distilled through a 40-plate column to give 75% recovery of the initial MeCN, containing <500 ppm I and essentially no II or H <sub>2</sub> O.				
IC	C07C				
CC	23-19 (Aliphatic Compounds)				
ST	acetonitrile purifn; acrylonitrile removal acetonitrile; water removal acetonitrile; drying acetonitrile				

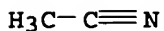
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of)  
IT 107-13-1P, preparation  
RL: PREP (Preparation)  
(removal of acetonitrile from)  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L7 ANSWER 19 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1970:498429 HCAPLUS  
DN 73:98429  
TI Dehydration of acetonitrile  
IN Vinogradova, A. G.; Galata, L. A.; Kofman, L. S.; Zaikina, T. G.; Pavlov,  
S. Yu.; Pavlova, S. P.  
SO U.S.S.R.  
From: Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki 1970, 47(17),  
20-1.  
CODEN: URXXAF  
DT Patent  
LA Russian  
FAN. CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI SU 270716		19700512	SU	19650531

AB MeCN is subjected to dehydration in the process of extractive  
distillation of a C4-hydrocarbon mixture To ensure recovery of MeCN the  
latter is introduced in the form of a ternary heteroazeotrope:  
MeCN-H2O-C4-hydrocarbon. The azeotrope is separated into layers,  
and the upper layer is refluxed while MeCN is recovered from the lower  
layer.  
IC C07C  
CC 23 (Aliphatic Compounds)  
ST acetonitrile dehydration  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of, by distillation)  
IT 75-05-8P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(purification of, by distillation)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L7 ANSWER 20 OF 20 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1969:490873 HCAPLUS  
DN 71:90873  
TI Purification of acetonitrile by azeotropic distillation

IN Sheely, Harold R.  
 PA Badger Co. Inc.  
 SO U.S., 5 pp.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3451899	A	19690624	US 1965-515500	19651221
	BE 691154	A	19670516	BE 1966-691154	19661214
	GB 1163958	A	19690910	GB 1966-1163958	19661214
	NL 6617918	A	19670622	NL 1966-17918	19661220
PRAI	US 1965-515500	A	19651221		

AB Crude acetonitrile (I) was continuously purified by distillation in a column operated with a H<sub>2</sub>O-separating and entraining agent such as C<sub>6</sub>H<sub>6</sub> (II) within and outside of the column. Thus, I, a byproduct of acrylonitrile production, was passed to the middle of a small diameter heads portion of a distillation column. The bottoms of the column were reboiled by heat exchange with steam at 70-80°, resulting in top temps. of 20-40°. A liquid side stream containing .apprx.100 ppm. HCN was withdrawn below the heads section, treated with 0.25N NaOH and 0.25N FeSO<sub>4</sub>, then combined with II to give a 5-20% solution of I in II. The aqueous layer was continuously decanted while the organic layer was washed with 5 volume% H<sub>2</sub>O. The relatively dry I was withdrawn from the bottom of the column and distilled in a second column.

IC C07C; B01D

INCL 203069000

CC 23 (Aliphatic Compounds)

ST acetonitriles purifn

IT 75-05-8P, preparation

RL: PUR (Purification or recovery); PREP (Preparation)  
 (purification of, by azeotropic distillation)

IT 75-05-8P, preparation

RL: PUR (Purification or recovery); PREP (Preparation)  
 (purification of, by azeotropic distillation)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

=> => d que 115

L3 1 SEA FILE=REGISTRY ABB=ON 75-05-8  
 L4 35132 SEA FILE=HCAPLUS ABB=ON L3  
 L5 132 SEA FILE=HCAPLUS ABB=ON L4 (L) PUR/RL  
 L6 68 SEA FILE=HCAPLUS ABB=ON L5 AND DISTILL?  
 L7 20 SEA FILE=HCAPLUS ABB=ON L6 AND AZEOTROP?  
 L8 386 SEA FILE=HCAPLUS ABB=ON ACETONITRILE (3A) PURIF?  
 L12 1225 SEA FILE=HCAPLUS ABB=ON L4 (L) PREP/RL  
 L13 38 SEA FILE=HCAPLUS ABB=ON L12 AND DISTILL? AND AZEOTROP?  
 L14 15 SEA FILE=HCAPLUS ABB=ON L8 AND L13  
 L15 5 SEA FILE=HCAPLUS ABB=ON (L7 OR L14) NOT L7

=> d 115 bib abs ind hitstr 1-5

L15 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1991:187969 HCAPLUS

DN 114:187969

TI Manufacture of high-purity acetonitrile by oxidative and  
**distillative** pretreatment of technical-grade acetonitrileIN Reinhardt, Juergen; Schickedanz, Hartmut; Knaack, Karl Ernst; Koehler,  
Richard; Pavel, Dietrich

PA VEB Petrolchemisches Kombinat Schwedt, Ger. Dem. Rep.

SO Ger. (East), 5 pp.

CODEN: GEXXA8

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DD 282818	A7	19900926	DD 1988-314908	19880420
PRAI	DD 1988-314908		19880420		

AB High-purity acetonitrile is prepared from tech. grade acetonitrile (manufactured as a byproduct in the ammoxidn. of propylene) by an oxidative pre- and post treatment with KMNO<sub>4</sub> at 310-335 K and **distilled** in an inert gas-purged **distillation** column to remove the H<sub>2</sub>O-acetonitrile **azeotrope**, dried in an inert gas-purged **distillation** column, and the still-adhering and impurities (e.g., oxazole, methacrylonitrile, acrylonitrile, allyl alc., acrolein, etc.) removed by a post **distn** . at atmospheric pressure in an inert gas-purged column at 335-355 K. This post **distillation** is conducted at reflux ratio 15-20:1 and the overhead is subjected to a 2-stage selective condensation consisting of partial condensation at 330-340 K and a partial condenser and a post condensation at 320-330 K with inert gas-purging made final condenser. A process flow diagram is presented.

IC ICM C07C253-34

ICS C07C255-03

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 48

ST bipyridine acetonitrile manuf; oxidative **distillative**pretreatment **acetonitrile purifn**; potassium

permanganate purity oxidn acetonitrile

IT 107-02-8P, 2-Propenal, uses and miscellaneous 107-12-0P, Propionitrile

107-13-1P, Acrylonitrile, uses and miscellaneous 107-18-6P, Allyl

alcohol, uses and miscellaneous 126-98-7P, Methacrylonitrile

288-42-6P, Oxazole

RL: PREP (Preparation); USES (Uses)

(formation and removal of, in **purification of acetonitrile**, oxidative and **distillative** pre- and post-treatment for)

IT 75-05-8P, Acetonitrile, preparation

RL: PREP (Preparation)

(manufacture of, high-purity, by oxidative and **distillative**

pretreatment of tech.-grade acetonitrile)

IT 7722-64-7, Potassium permanganate

RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidation by, of impurities contained in tech. acetonitrile)

IT 75-05-8P, Acetonitrile, preparation

RL: PREP (Preparation)

(manufacture of, high-purity, by oxidative and **distillative**

pretreatment of tech.-grade acetonitrile)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

$$\text{H}_3\text{C}-\text{C}\equiv\text{N}$$

L15 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1986:481147 HCAPLUS

DN 105:81147

TI Process and apparatus for purification of crude acetonitrile with recovery of pure hydrocyanic acid

IN Weiss, Peter; Lunzer, Friedrich

PA Chemie Linz A.-G., Austria

SO Austrian, 7 pp.

CODEN: AUXXAK

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	AT 379381	B	19851227	AT 1983-3418	19830927
	AT 8303418	A	19850515		
PRAI	AT 1983-3418		19830927		

AB HCN is recovered from crude MeCN by distillation at 28-30° (head)/1-1.5 bar, and the sump product is treated with a base (especially aqueous alkali hydroxide) at pH 8.5-11 and 200-250° with residence time 3-20 min. and distilled at 1-1.5 bar to give a water-MeCN azeotrope which is distilled at 2-15 bar to give a water-rich azeotrope (for recycle to the second distillation step) and pure MeCN. Thus, a mixture [byproduct of acrylonitrile (I) manufacture] of MeCN 350, water 135, free HCN 42, bound HCN 4, I 3, oxazole 6, and other compds. 60 kg was distilled at 28°/1.1 bar during 1 h to give 42 kg HCN. The sump product was treated with 8 kg 50% aqueous NaOH at pH 9.5 and 230° with residence time 10 min and distilled at .apprx.70° (head)/1.1 bar. A side stream (869 kg/h) was removed and distilled at 155° (sump)/7 bar to give 341 kg/h pure MeCN (containing free HCN <1, bound HCN <1, and I <10 ppm) from the sump. The vapor was recycled.

IC ICM C07C121-18

ICS C07C120-00

ICA C07C120-14

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes) Section cross-reference(s): 23

ST acetonitrile purifn distn; hydrocyanic acid recovery acetonitrile; acrylonitrile sepn acetonitrile; distn acetonitrile hydrocyanic acid

IT 75-05-8P, preparation

RL: PREP (Preparation)

(purification of crude, with recovery of hydrocyanic acid)

IT 74-90-8P, preparation

RL: PREP (Preparation)

(recovery of pure, in purification of crude acetonitrile)

IT 75-05-8P, preparation

RL: PREP (Preparation)

(purification of crude, with recovery of hydrocyanic acid)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



$$\text{H}_3\text{C}-\text{C}\equiv\text{N}$$

L15 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1985:597670 HCAPLUS

DN 103:197670

TI Purifying crude acetonitrile while producing pure hydrocyanic acid

IN Lunzer, Friedrich; Weiss, Peter

PA Lentia G.m.b.H. Chem. und Pharm. Erzeugnisse-Industriebedarf, Fed. Rep. Ger.

SO Ger. Offen., 12 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3334321	A1	19850411	DE 1983-3334321	19830922
PRAI	DE 1983-3334321		19830922		

AB Crude MeCN [75-05-8], obtained from acrylonitrile (I) [107-13-1] manufacture, is purified with production of pure HCN by distillation in a first column at 28-30°/1-1.5 bar to give pure HCN, treatment of the sump product with base (to give pH 8.5-11) followed by 3-20 min of heating at 200-250° to destroy I and bound HCN, distillation of the crude product at 1-1.5 bar in a second column to give a low-boiling, oxazole-rich distillate from the column head, a high-boiling sump product comprising water and impurities, and a water-MeCN azeotrope from the upper part of the column, and distilling the azeotrope at 2-15 bar in a third column to give pure MeCN from the sump while recycling a low-boiling azeotrope from the column head to the second distillation column. Thus, the above process was used to obtain purified MeCN and HCN from a mixture of MeCN 350, water 135, free HCN 42, bound HCN 4, I 3, oxazole 6, and other compds. 60 kg/h. The first column was kept at 28°/1.1 bar. The sump product from the first column was treated with 50% aqueous NaOH (8 kg/h) and heated 10 min. at 230°. The second column was kept at .apprx.70°/1.1 bar. The third column was kept at 155°/7 bar. The purified MeCN was removed from the third column at the rate of 341 kg/h. A mixture of 379 kg MeCN and 147 kg water/h was recycled from the third column to the second column. The purified MeCN contained free HCN <1, bound HCN <1, and I <10 ppm.

IC ICM C07C121-18

ICS C07C120-00; C01C003-04

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 35

ST acrylonitrile manuf acetonitrile purifn;  
acetonitrile hydrocyanic acid purifn distn

IT Distillation apparatus

(for acetonitrile and hydrocyanic acid from acrylonitrile manufacture)

IT 107-13-1P, preparation

RL: PREP (Preparation)

(manufacture of, acetonitrile and hydrocyanic acid from, purification of)

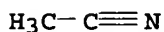
IT 74-90-8P, preparation

RL: PREP (Preparation)

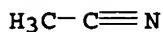
(purification of acetonitrile and, from acrylonitrile manufacture, distillation method for)

IT 75-05-8P, preparation

RL: PREP (Preparation)  
(purification of hydrocyanic acid and, from acrylonitrile manufacture,  
distillation method for)  
IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(purification of hydrocyanic acid and, from acrylonitrile manufacture,  
distillation method for)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L15 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1982:201586 HCAPLUS  
DN 96:201586  
TI Purification of acetonitrile from allyl alcohol by  
distillation  
AU Cori, Laura; De Micheli, Silvio; Delogu, Pietro  
CS Italy  
SO Chimica e l'Industria (Milan, Italy) (1982), 64(1), 3-7  
CODEN: CINMAB; ISSN: 0009-4315  
DT Journal  
LA English  
AB Liquid-vapor equilibrium curves of acetonitrile (I) [75-05-8]-allyl alc. (II)  
[107-18-6] systems containing various amts. of water showed that at low II  
concentration, the relative volatility of the system increased with increasing  
water concentration and the tangential azeotrope disappeared. This  
behavior suggested that a complete removal of II from I is possible in the  
presence of water in a column where I is withdrawn from the top and II  
from the bottom; water, which forms azeotropes with I and II, is  
distributed between the top and bottom fractions according to its feed  
concentration. These results were exptl. verified by total reflux distn  
. in a column with 30 theor. plates.  
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
ST acetonitrile distn sepn allyl alc  
IT 107-18-6P, preparation  
RL: PREP (Preparation)  
(separation of, from acetonitrile, by distillation)  
IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(separation of, from allyl alc., by distillation)  
IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(separation of, from allyl alc., by distillation)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L15 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1968:486411 HCAPLUS  
DN 69:86411  
TI Recovery of acetonitrile from its aqueous solutions containing  
acrylonitrile

IN Sankin, E. M.; Sinitsyn, V. I.; Gus'kov, K. A.; Gribov, A. M.; Zhakov, V. A.

SO U.S.S.R.

From: Izobret., Prom. Obraztsy, Tovarnye Znaki 1968, 45(11), 22.

CODEN: URXXAF

DT Patent

LA Russian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	SU 213805		19680320	SU	19660907
AB	The isolation and drying of MeCN from an aqueous solution is carried out by distilling a mixture of MeCN and acrylonitrile which contains up to 6-7% H <sub>2</sub> O. The remaining acrylonitrile is removed from the resulting mixture by azeotropic distillation and the resulting concentrated MeCN, which contains up to 2.5% H <sub>2</sub> O is subjected to fine drying by azeotropic distillation followed by the separation of the dried and concentrated MeCN by fractionation.				
IC	C07C				
CC	23 (Aliphatic Compounds)				
ST	acetonitrile sepn purifn				
IT	75-05-8P, preparation				
	RL: PREP (Preparation)				
	(recovery from aqueous solution with acrylonitrile)				
IT	107-13-1, uses and miscellaneous				
	RL: USES (Uses)				
	(removal from aqueous solns. with acetonitrile)				
IT	75-05-8P, preparation				
	RL: PREP (Preparation)				
	(recovery from aqueous solution with acrylonitrile)				
RN	75-05-8 HCAPLUS				
CN	Acetonitrile (8CI, 9CI) (CA INDEX NAME)				

H<sub>3</sub>C-C≡N

=> => d que

L3	1	SEA FILE=REGISTRY	ABB=ON	75-05-8
L4	35132	SEA FILE=HCAPLUS	ABB=ON	L3
L5	132	SEA FILE=HCAPLUS	ABB=ON	L4 (L) PUR/RL
L6	68	SEA FILE=HCAPLUS	ABB=ON	L5 AND DISTILL?
L7	20	SEA FILE=HCAPLUS	ABB=ON	L6 AND AZEOTROP?
L8	386	SEA FILE=HCAPLUS	ABB=ON	ACETONITRILE (3A) PURIF?
L12	1225	SEA FILE=HCAPLUS	ABB=ON	L4 (L) PREP/RL
L13	38	SEA FILE=HCAPLUS	ABB=ON	L12 AND DISTILL? AND AZEOTROP?
L14	15	SEA FILE=HCAPLUS	ABB=ON	L8 AND L13
L15	5	SEA FILE=HCAPLUS	ABB=ON	(L7 OR L14) NOT L7
L16	13	SEA FILE=HCAPLUS	ABB=ON	(L7 OR L15 OR L13) NOT (L7 OR L15)
L17	0	SEA FILE=HCAPLUS	ABB=ON	L8 AND L16

*13 more references*

=> d l16 1-13 bib abs ind hitstr 1-13

L16 ANSWER 1 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1994:152645 HCAPLUS  
 DN 120:152645  
 TI Recycling of solvent mixtures. Acetonitrile wastes

AU Nosko, Stefan; Burger, Dieter  
CS Chem. Landesuntersuchungsanst. Freiburg, Freiburg, W-7800, Germany  
SO LaborPraxis (1993), 17(2), 51-5  
CODEN: LAPRDE; ISSN: 0344-1733  
DT Journal  
LA German  
AB Recovery of CH<sub>3</sub>CN from HPLC wastes by azeotropic distn  
. is presented as an example for recycling of solvent mixts. in anal.  
labs.  
CC 80-3 (Organic Analytical Chemistry)  
Section cross-reference(s): 45, 60  
ST acetonitrile recovery azeotropic distn HPLC waste;  
solvent recycling HPLC waste; liq chromatog solvent recycling  
IT Recycling  
(of solvents from HPLC wastes)  
IT Solvents  
(recycling of, from wastes)  
IT Chromatography, column and liquid  
(high-performance, wastes from, solvent recycling from)  
IT 75-05-8P, Acetonitrile, preparation  
RL: ANST (Analytical study); PREP (Preparation)  
(recovery of, from HPLC wastes by azeotropic distn  
.)  
IT 75-05-8P, Acetonitrile, preparation  
RL: ANST (Analytical study); PREP (Preparation)  
(recovery of, from HPLC wastes by azeotropic distn  
.)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 2 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1992:15105 HCAPLUS  
DN 116:15105  
TI Concentration of water-soluble volatile organic compounds from aqueous  
samples by azeotropic microdistillation  
AU Bruce, Mark L.; Lee, Richard P.; Stephens, Marvin W.  
CS Wadsworth/ALERT Lab., Inc., North Canton, OH, 44720, USA  
SO Environmental Science and Technology (1992), 26(1), 160-3  
CODEN: ESTHAG; ISSN: 0013-936X  
DT Journal  
LA English  
AB Methanol and other similar water-soluble volatile organic compds. in zero  
headspace exts. and other aqueous matrixes can be analyzed by  
azeotropic microdistn., followed by gas chromatog. separation and  
detection. The method detection limits for methanol, 1-butanol, and  
2-methyl-1-propanol are at least 1 order of magnitude below the current  
land disposal treatment stds. using the toxicity characteristic leaching  
procedure (TCLP). A microdistn. system was developed to address the  
limitations of direct sample injection, purge-and-trap, and other  
azeotropic distillation systems. Sample volume requirements  
range from 10 to 40 mL. The concentration factors range from 70 to 230  
(depending on the analyte) with a 40-mL sample. The total distn  
. time is .apprx.5 min. Typical detection limits are between 5 and 15  
µg/L when the distillate is analyzed by gas chromatog. with  
flame ionization detection.

CC 80-4 (Organic Analytical Chemistry)  
 Section cross-reference(s): 61

ST water sol volatile org concn microdistn; distn water sol  
 volatile org concn; azeotropic microdistn water sol volatile  
 concn; aq sample analysis water sol volatile

IT Distillation apparatus  
 (azeotropic, micro-, for concentration of water-soluble volatile organic  
 compds. from aqueous samples for gas chromatog. determination)

IT Volatile substances  
 (water-soluble organic, concentration of, from aqueous samples by azeotropic  
 microdistn. for gas chromatog. determination)

IT Alcohols, analysis  
 RL: ANST (Analytical study)  
 (aliphatic, concentration of volatile, from aqueous samples by azeotropic  
 microdistn. for gas chromatog. determination)

IT 7732-18-5, Water, analysis  
 RL: ANST (Analytical study)  
 (concentration of organic volatile compds. from, by azeotropic  
 microdistn. for gas chromatog. determination)

IT 67-56-1P, Methanol, analysis 71-23-8P, 1-Propanol, analysis 71-36-3P,  
 1-Butanol, analysis 75-05-8P, Acetonitrile, analysis 78-83-1P,  
 2-Methyl-1-propanol, analysis 107-02-8P, Acrolein, analysis 107-12-0P,  
 Propionitrile 107-13-1P, Acrylonitrile, analysis 123-91-1P,  
 1,4-Dioxane, analysis 141-78-6P, Ethyl acetate, analysis  
 RL: ANST (Analytical study); PREP (Preparation)  
 (concentration of, from aqueous samples by azeotropic microdistn. for  
 gas chromatog. determination)

IT 75-05-8P, Acetonitrile, analysis  
 RL: ANST (Analytical study); PREP (Preparation)  
 (concentration of, from aqueous samples by azeotropic microdistn. for  
 gas chromatog. determination)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 3 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1988:96623 HCAPLUS

DN 108:96623

TI Improved process for the recovery of substantially pure acetonitrile by  
 the removal of cyanides from an aqueous acetonitrile stream

IN Marayil, Ravindranathan

PA Indian Petrochemicals Corp. Ltd., India

SO Indian, 9 pp.

CODEN: INXXAP

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	IN 159782	A	19870606	IN 1984-BO129	19840430
PRAI	IN 1984-BO129		19840430		

AB A process for the recovery of substantially pure CH<sub>3</sub>CN by the removal of  
 cyanides from an aqueous stream containing 40-80 weight% CH<sub>3</sub>CN comprises adding a  
 keto compound to the stream, adjusting the pH to 9-10 at 25° by  
 adding ≥1 inorg. reagents, refluxing the solution, readjusting the pH  
 to >9, and distilling the resulting solution at 78-85° under

normal pressure to obtain an azeotrope containing >90% CH<sub>3</sub>CN. Thus, a sample containing 50 weight% CH<sub>3</sub>CN and 4420 mg/L cyanide was added 37% aqueous HCHO solution at 1:1.75 cyanide-HCHO mol ratio, the solution was adjusted to pH 9.0 by adding NaOH at 25°, refluxed for 1 h, readjusted to pH >9.0, and distilled at 75-85° and 760 mm Hg; the total CH<sub>3</sub>CN recovery was 94%, and cyanide concentration in the distillate was 6.5 mg/L.

IC ICM B01D003-36  
ICS C07B021-00  
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
ST acetonitrile recovery cyanide removal; formaldehyde sodium hydroxide  
acetonitrile recovery; keto cyanide removal acetonitrile recovery;  
IT Cyanides, uses and miscellaneous  
RL: REM (Removal or disposal); PROC (Process)  
(removal of, in acetonitrile recovery from manufacturing streams)  
IT 50-00-0, Formaldehyde, reactions 67-64-1, Acetone, reactions 108-94-1,  
Cyclohexanone, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with cyanides, by pH control, for recovery of  
acetonitrile from crude streams)  
IT 75-05-8P, Acetonitrile, preparation  
RL: PREP (Preparation)  
(recovery of, from crude stream, by cyanide removal, with pH control)  
IT 75-05-8P, Acetonitrile, preparation  
RL: PREP (Preparation)  
(recovery of, from crude stream, by cyanide removal, with pH control)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 4 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1987:178452 HCAPLUS

DN 106:178452

TI Removal of water from acetonitrile solutions

IN Gothard, Francisc; Langshaw, Vielka; Vilcu, Rodica; Cerghitescu, Maria

PA Institutul de Cercetari, Inginerie Tehnologica si Proiectari pentru  
Rafinarii, Rom.

SO Rom., 4 pp.

CODEN: RUXXA3

DT Patent

LA Romanian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 87522	B1	19851031	RO 1983-110101	19830222
PRAI	RO 1983-110101		19830222		

AB Aqueous solns. (e.g., 31%) of MeCN, useful in acrylonitrile manufacture, are dried by first countercurrent contact with PhMe-free industrial xylene in an extraction column, followed by azeotropic distillation of the column top product.

IC ICM C07C121-18

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 35

ST drying acetonitrile aq soln; xylene extn acetonitrile aq soln;  
acrylonitrile manuf acetonitrile drying

IT Drying

(of acetonitrile aqueous solns. by extraction with xylene)

IT 75-05-8P, Acetonitrile, preparation  
 RL: PREP (Preparation)  
 (drying of aqueous solns. of, by extraction with xylene)  
 IT 1330-20-7, Xylene, uses and miscellaneous  
 RL: USES (Uses)  
 (extraction by, in drying of acetonitrile aqueous solns.)  
 IT 107-13-1P, Acrylonitrile, preparation  
 RL: PREP (Preparation)  
 (manufacture of, drying of acetonitrile in)  
 IT 75-05-8P, Acetonitrile, preparation  
 RL: PREP (Preparation)  
 (drying of aqueous solns. of, by extraction with xylene)  
 RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

$\text{H}_3\text{C}-\text{C}\equiv\text{N}$

L16 ANSWER 5 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN : 1986:462694 HCAPLUS  
 DN 105:62694  
 TI Nitro compounds by vapor-phase nitration of olefins  
 IN Wang, Shue Cieh Paul  
 PA W. R. Grace and Co., USA  
 SO Eur. Pat. Appl., 21 pp.  
 CODEN: EPXXDW

DT Patent  
 LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 174600	A1	19860319	EP 1985-111167	19850904
	EP 174600	B1	19880309		
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
	US 4766257	A	19880823	US 1984-649765	19840912
	AT 32884	E	19880315	AT 1985-111167	19850904
	CA 1260502	A1	19890926	CA 1985-490477	19850911
PRAI	US 1984-649765	A	19840912		
	EP 1985-111167	A	19850904		

OS CASREACT 105:62694; MARPAT 105:62694

AB Nitroalkanes and nitroarom. compds. are formed by vapor-phase nitration of C3-10 olefins at 2-20 bars pressure at 100-500° in a homogeneous gas phase with NO2 or HNO3 alone or in the presence of O and/or H2O. Thus, propylene 2479, O 297, H2O 771, N 8666, and NO2 1236 mmol/h were fed into a tubular reactor at 300° and 10 atm, such that the propylene had a reactor residence time of 5.7 s. The reactor effluents were cooled and separated into liquid organic and aqueous phases, and the gaseous effluents (containing

unreacted olefin, nitric oxide and inert gases) were separated and the nitrogen oxide treated with O and recycled to the reactor. The condensed organic and aqueous liquid phases were azeotropically distilled to remove water, the heavy byproducts were removed from the bottom, and the nitroalkanes taken overhead to a condenser and then to an oxygenate-removal distillation column, the bottom products of which comprised the nitrohydrocarbon products. The products showed a carbon selectivity of MeNO2 12.2, 2-nitropropane 0.9, HCOOH 7.8, AcOH 2.9, EtOH 2.5, CH3CHO 9.7, acetone 3.0, nitrile 8.1, nitrite 4.1, CO 13.3, and CO2 35.2%. The total carbon conversion of the reaction was 13.5%.

IC ICM C07C076-02  
ICS C07C079-02  
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 23, 25  
ST nitroparaffin vapor phase nitration olefin; continuous vapor phase olefin nitration  
IT Nitriles, preparation  
Nitrites  
RL: FORM (Formation, nonpreparative)  
(formation of, in vapor-phase nitration of olefins)  
IT Alkenes, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(nitration of, to nitro compds., vapor-phase, continuous)  
IT Nitration  
(of olefins, vapor-phase, continuous)  
IT Alkanes, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(nitro, preparation of)  
IT 75-05-8P, preparation 107-12-0P 123-38-6P, preparation  
123-63-7P  
RL: FORM (Formation, nonpreparative); PREP (Preparation)  
(formation of, in vapor-phase nitration of butenes)  
IT 64-17-5P, preparation 64-18-6P, preparation 64-19-7P, preparation  
67-64-1P, preparation 75-07-0P, preparation 79-46-9P  
RL: FORM (Formation, nonpreparative); PREP (Preparation)  
(formation of, in vapor-phase nitration of propylene)  
IT 7732-18-5, uses and miscellaneous 7782-44-7, uses and miscellaneous  
RL: USES (Uses)  
(in continuous vapor-phase nitration of propylene)  
IT 79-24-3P 108-03-2P  
RL: PREP (Preparation)  
(manufacture of, by continuous vapor-phase nitration of butenes)  
IT 10102-44-0, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(nitration by, of propylene, continuous, vapor-phase)  
IT 106-98-9, reactions 107-01-7 115-07-1, reactions 115-11-7, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(nitration of, continuous, vapor-phase)  
IT 75-52-5P, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(preparation of, by vapor-phase nitration of propylene)  
IT 75-05-8P, preparation  
RL: FORM (Formation, nonpreparative); PREP (Preparation)  
(formation of, in vapor-phase nitration of butenes)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

$\text{H}_3\text{C}-\text{C}\equiv\text{N}$

L16 ANSWER 6 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1985:64290 HCAPLUS  
DN 102:64290  
TI Removing water form azeotropes  
IN Robinson, Lee Fisher; Morrison, Angus William  
PA UK  
SO Brit. UK Pat. Appl., 6 pp.  
CODEN: BAXXDU



DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2138807	A1	19841031	GB 1984-5417	19840301
PRAI	GB 1983-5869	A	19830303		
	GB 1983-5870	A	19830303		
AB	Water is removed from azeotropes (e.g., CH <sub>3</sub> CN, MEK) using desiccants (e.g., Na <sub>2</sub> SO <sub>4</sub> , silica gel, activated A <sub>2</sub> O <sub>3</sub> , CaSO <sub>4</sub> , Na <sub>2</sub> CO <sub>3</sub> , CaCl <sub>2</sub> , CaO). The desiccant is regenerated in a distillation column from which the desiccant, water, and residual azeotrope are withdrawn sep.				
IC	C07C029-76; C07C045-79; C07C120-00				
CC	48-1 (Unit Operations and Processes) Section cross-reference(s): 2, 45, 51				
ST	azeotrope water removal desiccant				
IT	Silica gel, uses and miscellaneous RL: USES (Uses) (drying by, of azeotrope)				
IT	Azeotropes and Azeotropy (drying of, by desiccants)				
IT	Drying (of azeotropes, by desiccants)				
IT	Gasoline RL: PROC (Process) (gasohol, drying of, by desiccants)				
IT	497-19-8, uses and miscellaneous 1305-78-8, uses and miscellaneous 1344-28-1, uses and miscellaneous 7757-82-6, uses and miscellaneous 7778-18-9 10043-52-4, uses and miscellaneous RL: USES (Uses) (drying by, of azeotrope)				
IT	75-05-8P, preparation 78-93-3P, preparation RL: PREP (Preparation) (drying of, desiccants for)				
IT	75-05-8P, preparation RL: PREP (Preparation) (drying of, desiccants for)				
RN	75-05-8 HCAPLUS				
CN	Acetonitrile (8CI, 9CI) (CA INDEX NAME)				

H<sub>3</sub>C-C≡N

L16 ANSWER 7 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1983:109287 HCAPLUS  
DN 98:109287  
TI Separation of an acetonitrile-water azeotrope  
IN Bala, Elena; Botez, Ligia F.  
PA Combinatul Petrochimic, Pitesti, Rom.  
SO Rom., 2 pp.  
CODEN: RUXXA3  
DT Patent  
LA Romanian  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 68241	B	19800815	RO 1976-86077	19760511

PRAI RO 1976-86077 A 19760511

AB The title **azeotrope** is separated by treatment with NaCl and CaCl<sub>2</sub> and fractional **distillation** to give MeCN [75-05-8] containing 0.2% water. Thus, 10.70 L 16:84 water-MeCN **azeotrope** was mixed with 300 g NaCl, and the aqueous NaCl was separated to give MeCN containing .apprx.5% water. This MeCN was mixed with 500 g CaCl<sub>2</sub> and the aqueous layer was separated to give 8.5 L MeCN containing .apprx.1% water, which was fractionated to give a **distillate** containing 5-15% water, leaving 7.3 L MeCN containing <0.3% water.

IC C07C121-18

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

ST acetonitrile **azeotrope** drying; sodium chloride drying

IT acetonitrile; calcium chloride drying aceonitrile

IT Drying

(of acetonitrile-water **azeotropes**, with chloride salts and fractionation)

IT 75-05-8P, uses and miscellaneous

RL: PREP (Preparation); USES (Uses)

(drying of aqueous **azeotropes**, by chlorides with **distn**

.)

IT 7647-14-5, uses and miscellaneous 10043-52-4, uses and miscellaneous

RL: USES (Uses)

(in drying of acetonitrile **azeotropes**)

IT 75-05-8P, uses and miscellaneous

RL: PREP (Preparation); USES (Uses)

(drying of aqueous **azeotropes**, by chlorides with **distn**

.)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

 $\text{H}_3\text{C}-\text{C}\equiv\text{N}$ 

L16 ANSWER 8 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1983:109284 HCAPLUS

DN 98:109284

TI Drying of acetonitrile

IN Matei, Gheorghe; Varvarichi, Viorel; Moga, Ana; Dobrin, Gheorghe

PA Combinatul Petrochimic, Pitesti, Rom.

SO Rom., 3 pp.

CODEN: RUXXA3

DT Patent

LA Romanian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 64553	B	19781115	RO 1974-77835	19740227
PRAI	RO 1974-77835	A	19740227		

AB The MeCN [75-05-8] by-product from the ammoxidn. of propylene [115-07-1] to acrylonitrile (I) [107-13-1] was dried by an **azeotropic distillation**, in which I is added to the refluxing MeCN-water **azeotrope**, resulting in an I-MeCN-water **azeotrope** which has a b.p. much lower than the MeCN-water **azeotrope** and traps water in the top fraction of the **distillation**. This fraction is condensed and supercooled to give 2 phases, from which the organic phase is sent to the reflux zone of the **azeotropic distillation** and the aqueous phase is removed from the system, with MeCN being removed through a side valve. The resulting MeCN was 99.5% pure, and the process could be

automated.

IC C07C121-18

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 23, 35, 48

ST acetonitrile drying **azeotropic distn**; acrylonitrile  
manuf acetonitrile byproduct drying; propylene ammoxidn acetonitrile  
byproduct drying

IT Drying  
(of acetonitrile, **azeotropic distillation** in,  
acrylonitrile additive in)

IT Ammoxidation  
(of propylene, drying of acetonitrile by-product in)

IT 115-07-1, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(ammoxidn. of, drying of acetonitrile by-product in)

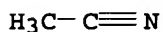
IT 75-05-8P, preparation  
RL: **PREP (Preparation)**  
(drying of, **azeotropic distillation** in, acrylonitrile  
additive in)

IT 107-13-1P, preparation  
RL: **PREP (Preparation)**  
(manufacture of, drying of acetonitrile by-product in)

IT 75-05-8P, preparation  
RL: **PREP (Preparation)**  
(drying of, **azeotropic distillation** in, acrylonitrile  
additive in)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L16 ANSWER 9 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1980:471053 HCAPLUS

DN 93:71053

TI Acetonitrile from the acetonitrile-water **azeotrope**

IN Bader, Dietmar; Nistor, Marian; Bader, Pia Camilla

PA Combinatul Petrochimic Pitesti, Rom.

SO Rom., 2 pp.  
CODEN: RUXXA3

DT Patent

LA Romanian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 64887	B	19781215	RO 1972-69540	19720126
PRAI	RO 1972-69540	A	19720126		

AB **Azeotropes** containing 15-20% H2O were **distilled** at 10-50 mm  
to give purified MeCN. **Distillation** of a MeCN-H2O **azeotrope**  
containing 17% H2O gave 78.3% MeCN of 94.5% purity.

IC C07C121-18

CC 23-19 (Aliphatic Compounds)

ST acetonitrile water **azeotrope distn**

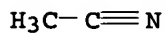
IT 75-05-8P, preparation  
RL: **PREP (Preparation)**  
(separation of, from aqueous **azeotropes**)

IT 75-05-8P, preparation  
RL: **PREP (Preparation)**

(separation of, from aqueous azeotropes)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L16 ANSWER 10 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1978:190123 HCAPLUS

DN 88:190123

TI Separation of acetonitrile from its azeotropic mixture with water

IN Ghidarcea, Ion; Nica, Ana; Chivulescu, Elena

PA Combinatul Petrochimic Pitesti, Rom.

SO Rom., 2 pp.

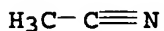
CODEN: RUXXA3

DT Patent

LA Romanian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 60227	B	19760715	RO 1973-73933	19730222
PRAI	RO 1973-73933	A	19730222		
AB	HO(CH <sub>2</sub> CH <sub>2</sub> O)nH (n = 1, 2) were added to MeCN-water mixts. and glycol-water azeotropes were distilled				
IC	C07C121-18				
CC	23-19 (Aliphatic Compounds)				
ST	acetonitrile sepn aq mixt				
IT	75-05-8P, preparation				
	RL: PREP (Preparation)				
	(separation from aqueous mixts., by distillation of water-ethylene glycol azeotrope)				
IT	75-05-8P, preparation				
	RL: PREP (Preparation)				
	(separation from aqueous mixts., by distillation of water-ethylene glycol azeotrope)				
RN	75-05-8 HCAPLUS				
CN	Acetonitrile (8CI, 9CI) (CA INDEX NAME)				



L16 ANSWER 11 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1970:434837 HCAPLUS

DN 73:34837

TI Continuous separation of acrylonitrile and acetonitrile

IN Schoenbeck, Rupert; Krzemicki, Kasimir

PA Oesterreichische Stickstoffwerke A.-G.

SO Austrian, 5 pp.

CODEN: AUXXAK

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	AT 280235		19700410	AT	19680520

AB A process for the continuous separation of acrylonitrile (I) and acetonitrile (II) obtained in the reaction of propylene and NH<sub>3</sub> with O or air, by absorption of the H<sub>2</sub>O-soluble reaction products in H<sub>2</sub>O, comprises direct introduction of the absorption solution into an extraction-distillation with H<sub>2</sub>O as extracting agent, reclaiming of I free from II at the head of the extraction-distillation, removal of the fraction containing II from the lower part of the extraction-distillation column as side stream, and separation of the II azeotrope from the chief portion of the H<sub>2</sub>O in a stripping zone adjacent to the extraction distillation. The mixture to be separated is passed into the extraction-distillation in the upper half of the column which is preferably a bottom column, and the side stream containing II is branched off at least above the 10th bottom (from below) and preferably above the 15th bottom, whereby the part of the column below the branching is at most half of the total column. Between the inlet of the mixture to be separated and the branching of the side stream lie at least 3 and preferably at least 5 bottoms, and the amount of the side stream is so adjusted that in the sump of the extraction-distillation at least as much H<sub>2</sub>O, free from I and practically free from II, is obtained as is required at the head of the column as extraction H<sub>2</sub>O, which H<sub>2</sub>O is recycled to the head of the column after cooling, while the aqueous liquid obtained in the sump of the stripping column after removal of the main amount of II which contains ≥300 ppm. II is recycled into the absorption of the H<sub>2</sub>O-soluble reaction products of I synthesis. A flow diagram of the process is given.

IC C07C

CC 23 (Aliphatic Compounds)

ST acrylonitrile acetonitrile sepn continuous; acetonitrile acrylonitrile continuous sepn; sepn continuous acrylonitrile acetonitrile; nitriles acrylo aceto sepn

IT 107-13-1P, preparation  
RL: PREP (Preparation)  
(separation of, from acetonitrile)

IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(separation of, from acrylonitrile)

IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(separation of, from acrylonitrile)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 12 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1969:3320 HCAPLUS

DN 70:3320

TI Recovery of anhydrous acetonitrile from dilute aqueous solutions

IN Anisimova, E. G.; Berlin, L. F.; Vinogradova, A. G.; Galata, L. A.; Kofman, L. S.; Svirskaia, K. I.; Chirikova, Z. P.; Martynova, Yu. N.

PA State Design and Scientific-Research Institute of the Synthetic Rubber Industry

SO U.S.S.R.  
From: Izobret., Prom. Obraztsy, Tovarnye Znaki 1968, 45(21), 22.  
CODEN: URXXAF

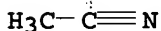
DT Patent

LA Russian

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI SU 220981 19680701 SU 19631110  
 AB Anhydrous MeCN is recovered from dilute aqueous solns. by azeotropic distillation. The solns. are first subjected to azeotropic distillation at atmospheric pressure or in vacuo; the resulting azeotropic mixture is then subjected to a repeated azeotropic distillation at 1-7 absolute atmospheric pressure.  
 IC C07C  
 CC 23 (Aliphatic Compounds)  
 ST acetonitrile recovery  
 IT 75-05-8P, preparation  
 RL: PREP (Preparation)  
 (recovery of, by azeotropic distillation)  
 IT 75-05-8P, preparation  
 RL: PREP (Preparation)  
 (recovery of, by azeotropic distillation)  
 RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L16 ANSWER 13 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1968:51783 HCAPLUS

DN 68:51783

TI Distillation of tetramethyl lead-acetonitrile with a thermal stabilizer

IN Hannan, John F.

PA du Pont de Nemours, E. I., and Co.

SO U.S., 5 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3362889	A	19680109	US 1966-529879	19660224
PRAI	US 1966-529879	A	19660224		

AB A method of stabilizing Me4Pb during distillation of Me4Pb-acetonitrile azeotropes, in which a thermal stabilizer is introduced sep. into the distillation unit is described. A feed containing Me4Pb 6, acetonitrile 69.2, H2O 5.3, and Et4NBr 19.5% was preheated to 65° and fed at 4 gal./hr. to the midpoint of a lagged 4 in. + 10 ft. 316 stainless steel column packed with 1/4-in. Intalox ceramic saddles and having 10 theoretical plates. Simultaneously, PhMe at 25° was fed at the top of the column at 0.5 lb/hr. The total feed was distilled at a reflux ratio of 10:1. The Me4Pb-poor upper layer of the distillate was recycled to the column while 2.5-3 lb./hr. Me4Pb-rich lower layer was recovered. The recovered distillate contained Me4Pb 76, PhMe 18, acetonitrile 5.5, and H2O 0.5%. The bottoms contained acetonitrile 69, H2O 6, Et4NBr 26%, and no detectable Me4Pb.

INCL 203006000

CC 51 (Petroleum, Petroleum Derivatives, and Related Products)

ST DISTN TETRAMETHYLLEAD; ANTIKNOCK COMPDS STABILIZERS; GASOLINE ANTIKNOCK COMPDS; TETRAMETHYLLEAD DISTN; FUELS ANTIKNOCK COMPDS STABILIZERS

IT 108-88-3, uses and miscellaneous

RL: USES (Uses)  
(as stabilizer, thermal, for tetramethyl lead-acetonitrile azeotropic distillation)

IT 75-74-1P  
RL: PREP (Preparation)  
(azeotropic distillation of acetonitrile-, thermal stabilizers for, toluene as)

IT 75-05-8P, uses and miscellaneous  
RL: PREP (Preparation); USES (Uses)  
(azeotropic distillation of tetramethyl lead-, thermal stabilizer in, toluene as)

IT 75-05-8P, uses and miscellaneous  
RL: PREP (Preparation); USES (Uses)  
(azeotropic distillation of tetramethyl lead-, thermal stabilizer in, toluene as)

RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 1 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1994:152645 HCAPLUS  
DN 120:152645  
TI Recycling of solvent mixtures. Acetonitrile wastes  
AU Nosko, Stefan; Burger, Dieter  
CS Chem. Landesuntersuchungsanst. Freiburg, Freiburg, W-7800, Germany  
SO LaborPraxis (1993), 17(2), 51-5  
CODEN: LAPRDE; ISSN: 0344-1733  
DT Journal  
LA German  
AB Recovery of CH<sub>3</sub>CN from HPLC wastes by azeotropic distn  
. is presented as an example for recycling of solvent mixts. in anal. labs.  
CC 80-3 (Organic Analytical Chemistry)  
Section cross-reference(s): 45, 60  
ST acetonitrile recovery azeotropic distn HPLC waste;  
solvent recycling HPLC waste; liq chromatog solvent recycling  
IT Recycling  
(of solvents from HPLC wastes)  
IT Solvents  
(recycling of, from wastes)  
IT Chromatography, column and liquid  
(high-performance, wastes from; solvent recycling from)  
IT 75-05-8P, Acetonitrile, preparation  
RL: ANST (Analytical study); PREP (Preparation)  
(recovery of, from HPLC wastes by azeotropic distn .)  
IT 75-05-8P, Acetonitrile, preparation  
RL: ANST (Analytical study); PREP (Preparation)  
(recovery of, from HPLC wastes by azeotropic distn .)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 2 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1992:15105 HCAPLUS  
DN 116:15105  
TI Concentration of water-soluble volatile organic compounds from aqueous samples by azeotropic microdistillation  
AU Bruce, Mark L.; Lee, Richard P.; Stephens, Marvin W.  
CS Wadsworth/ALERT Lab., Inc., North Canton, OH, 44720, USA  
SO Environmental Science and Technology (1992), 26(1), 160-3  
CODEN: ESTHAG; ISSN: 0013-936X  
DT Journal  
LA English  
AB Methanol and other similar water-soluble volatile organic compds. in zero headspace exts. and other aqueous matrixes can be analyzed by azeotropic microdistn., followed by gas chromatog. separation and detection. The method detection limits for methanol, 1-butanol, and 2-methyl-1-propanol are at least 1 order of magnitude below the current land disposal treatment stds. using the toxicity characteristic leaching procedure (TCLP). A microdistn. system was developed to address the limitations of direct sample injection, purge-and-trap, and other azeotropic distillation systems. Sample volume requirements range from 10 to 40 mL. The concentration factors range from 70 to 230 (depending on the analyte) with a 40-mL sample. The total distn. time is .apprx.5 min. Typical detection limits are between 5 and 15 µg/L when the distillate is analyzed by gas chromatog. with flame ionization detection.  
CC 80-4 (Organic Analytical Chemistry)  
Section cross-reference(s): 61  
ST water sol volatile org concn microdistn; distn water sol volatile org concn; azeotropic microdistn water sol volatile concn; aq sample analysis water sol volatile  
IT Distillation apparatus  
(azeotropic, micro-, for concentration of water-soluble volatile organic compds. from aqueous samples for gas chromatog. determination)  
IT Volatile substances  
(water-soluble organic, concentration of, from aqueous samples by azeotropic microdistn. for gas chromatog. determination)  
IT Alcohols, analysis  
RL: ANST (Analytical study)  
(aliphatic, concentration of volatile, from aqueous samples by azeotropic microdistn. for gas chromatog. determination)  
IT 7732-18-5, Water, analysis  
RL: ANST (Analytical study)  
(concentration of organic volatile compds. from, by azeotropic microdistn. for gas chromatog. determination)  
IT 67-56-1P, Methanol, analysis 71-23-8P, 1-Propanol, analysis 71-36-3P, 1-Butanol, analysis 75-05-8P, Acetonitrile, analysis 78-83-1P, 2-Methyl-1-propanol, analysis 107-02-8P, Acrolein, analysis 107-12-0P, Propionitrile 107-13-1P, Acrylonitrile, analysis 123-91-1P, 1,4-Dioxane, analysis 141-78-6P, Ethyl acetate, analysis  
RL: ANST (Analytical study); PREP (Preparation)  
(concentration of, from aqueous samples by azeotropic microdistn. for gas chromatog. determination)  
IT 75-05-8P, Acetonitrile, analysis  
RL: ANST (Analytical study); PREP (Preparation)  
(concentration of, from aqueous samples by azeotropic microdistn. for gas chromatog. determination)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



$\text{H}_3\text{C}-\text{C}\equiv\text{N}$ 

L16 ANSWER 3 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1988:96623 HCAPLUS

DN 108:96623

TI Improved process for the recovery of substantially pure acetonitrile by the removal of cyanides from an aqueous acetonitrile stream

IN Marayil, Ravindranathan

PA Indian Petrochemicals Corp. Ltd., India

SO Indian; 9 pp.

CODEN: INXXAP

DT Patent

LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI IN 159782	A	19870606	IN 1984-B0129	19840430
PRAI IN 1984-B0129		19840430		

AB A process for the recovery of substantially pure  $\text{CH}_3\text{CN}$  by the removal of cyanides from an aqueous stream containing 40-80 weight%  $\text{CH}_3\text{CN}$  comprises adding a keto compound to the stream, adjusting the pH to 9-10 at 25° by adding  $\geq 1$  inorg. reagents, refluxing the solution, readjusting the pH to  $>9$ , and distilling the resulting solution at 78-85° under normal pressure to obtain an azeotrope containing  $>90\%$   $\text{CH}_3\text{CN}$ . Thus, a sample containing 50 weight%  $\text{CH}_3\text{CN}$  and 4420 mg/L cyanide was added 37% aqueous  $\text{HCHO}$  solution at 1:1.75 cyanide- $\text{HCHO}$  mol ratio, the solution was adjusted to pH 9.0 by adding  $\text{NaOH}$  at 25°, refluxed for 1 h, readjusted to pH  $>9.0$ , and distilled at 75-85° and 760 mm Hg; the total  $\text{CH}_3\text{CN}$  recovery was 94%, and cyanide concentration in the distillate was 6.5 mg/L.

IC ICM B01D003-36

ICS C07B021-00

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

ST acetonitrile recovery cyanide removal; formaldehyde sodium hydroxide

acetonitrile recovery; keto cyanide removal acetonitrile recovery

IT Cyanides, uses and miscellaneous

RL: REM (Removal or disposal); PROC (Process)

(removal of, in acetonitrile recovery from manufacturing streams)

IT 50-00-0, Formaldehyde, reactions 67-64-1, Acetone, reactions 108-94-1, Cyclohexanone, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(reaction of, with cyanides, by pH control, for recovery of acetonitrile from crude streams)

IT 75-05-8P, Acetonitrile, preparation

RL: PREP (Preparation)

(recovery of, from crude stream, by cyanide removal, with pH control)

IT 75-05-8P, Acetonitrile, preparation

RL: PREP (Preparation)

(recovery of, from crude stream, by cyanide removal, with pH control)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

 $\text{H}_3\text{C}-\text{C}\equiv\text{N}$

L16 ANSWER 4 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1987:178452 HCAPLUS

DN 106:178452

TI Removal of water from acetonitrile solutions

IN Gothard, Francisc; Langshaw, Vielka; Vilcu, Rodica; Cerghitescu, Maria

PA Institutul de Cercetari, Inginerie Tehnologica si Proiectari pentru Rafinarii, Rom.

SO Rom., 4 pp.

CODEN: RUXXA3

DT Patent

LA Romanian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 87522	B1	19851031	RO 1983-110101	19830222

PRAI RO 1983-110101 19830222

AB Aqueous solns. (e.g., 31%) of MeCN, useful in acrylonitrile manufacture, are dried by first countercurrent contact with PhMe-free industrial xylene in an extraction column, followed by azeotropic distillation of the column top product.

IC ICM C07C121-18

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 35

ST drying acetonitrile aq soln; xylene extn acetonitrile aq soln; acrylonitrile manuf acetonitrile drying

IT Drying

(of acetonitrile aqueous solns. by extraction with xylene)

IT 75-05-8P, Acetonitrile, preparation

RL: PREP (Preparation)

(drying of aqueous solns. of, by extraction with xylene)

IT 1330-20-7, Xylene, uses and miscellaneous

RL: USES (Uses)

(extraction by, in drying of acetonitrile aqueous solns.)

IT 107-13-1P, Acrylonitrile, preparation

RL: PREP (Preparation)

(manufacture of, drying of acetonitrile in)

IT 75-05-8P, Acetonitrile, preparation

RL: PREP (Preparation)

(drying of aqueous solns. of, by extraction with xylene)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

 $\text{H}_3\text{C}-\text{C}\equiv\text{N}$ 

L16 ANSWER 5 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1986:462694 HCAPLUS

DN 105:62694

TI Nitro compounds by vapor-phase nitration of olefins

IN Wang, Shue Cieh Paul

PA W. R. Grace and Co., USA

SO Eur. Pat. Appl., 21 pp.

CODEN: EPXXDW

DT Patent

LA English

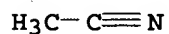
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI EP 174600 A1 19860319 EP 1985-111167 19850904  
 EP 174600 B1 19880309  
 R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE  
 US 4766257 A 19880823 US 1984-649765 19840912  
 AT 32884 E 19880315 AT 1985-111167 19850904  
 CA 1260502 A1 19890926 CA 1985-490477 19850911  
 PRAI US 1984-649765 A 19840912  
 EP 1985-111167 A 19850904  
 OS CASREACT 105:62694; MARPAT 105:62694  
 AB Nitroalkanes and nitroarom. compds. are formed by vapor-phase nitration of C3-10 olefins at 2-20 bars pressure at 100-500° in a homogeneous gas phase with NO2 or HNO3 alone or in the presence of O and/or H2O. Thus, propylene 2479, O 297, H2O 771, N 8666, and NO2 1236 mmol/h were fed into a tubular reactor at 300° and 10 atm, such that the propylene had a reactor residence time of 5.7 s. The reactor effluents were cooled and separated into liquid organic and aqueous phases, and the gaseous effluents (containing unreacted olefin, nitric oxide and inert gases) were separated and the nitrogen oxide treated with O and recycled to the reactor. The condensed organic and aqueous liquid phases were azeotropically distilled to remove water, the heavy byproducts were removed from the bottom, and the nitroalkanes taken overhead to a condenser and then to an oxygenate-removal distillation column, the bottom products of which comprised the nitrohydrocarbon products. The products showed a carbon selectivity of MeNO2 12.2, 2-nitropropane 0.9, HCOOH 7.8, AcOH 2.9, EtOH 2.5, CH3CHO 9.7, acetone 3.0, nitrile 8.1, nitrite 4.1, CO 13.3, and CO2 35.2%. The total carbon conversion of the reaction was 13.5%.

IC ICM C07C076-02  
 ICS C07C079-02  
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
 Section cross-reference(s): 23, 25  
 ST nitroparaffin vapor phase nitration olefin; continuous vapor phase olefin nitration  
 IT Nitriles, preparation  
 Nitrites  
 RL: FORM (Formation, nonpreparative)  
 (formation of, in vapor-phase nitration of olefins)  
 IT Alkenes, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (nitration of, to nitro compds., vapor-phase, continuous)  
 IT Nitration  
 (of olefins, vapor-phase, continuous)  
 IT Alkanes, preparation  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (nitro, preparation of)  
 IT 75-05-8P, preparation 107-12-0P 123-38-6P, preparation  
 123-63-7P  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in vapor-phase nitration of butenes)  
 IT 64-17-5P, preparation 64-18-6P, preparation 64-19-7P, preparation  
 67-64-1P, preparation 75-07-0P, preparation 79-46-9P  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in vapor-phase nitration of propylene)  
 IT 7732-18-5, uses and miscellaneous 7782-44-7, uses and miscellaneous  
 RL: USES (Uses)  
 (in continuous vapor-phase nitration of propylene)  
 IT 79-24-3P 108-03-2P  
 RL: PREP (Preparation)  
 (manufacture of, by continuous vapor-phase nitration of butenes)  
 IT 10102-44-0, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (nitration by, of propylene, continuous, vapor-phase)  
 IT 106-98-9, reactions 107-01-7 115-07-1, reactions 115-11-7, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (nitration of, continuous, vapor-phase)  
 IT 75-52-5P, preparation  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (preparation of, by vapor-phase nitration of propylene)  
 IT 75-05-8P, preparation  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in vapor-phase nitration of butenes)  
 RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L16 ANSWER 6 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1985:64290 HCAPLUS

DN 102:64290

TI Removing water form **azeotropes**

IN Robinson, Lee Fisher; Morrison; Angus William

PA UK

SO Brit. UK Pat. Appl., 6 pp.

CODEN: BAXXDU

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2138807	A1	19841031	GB 1984-5417	19840301
PRAI	GB 1983-5869	A	19830303		
	GB 1983-5870	A	19830303		

AB Water is removed from **azeotropes** (e.g., CH<sub>3</sub>CN, MEK) using desiccants (e.g., Na<sub>2</sub>SO<sub>4</sub>, silica gel, activated A<sub>2</sub>O<sub>3</sub>, CaSO<sub>4</sub>, Na<sub>2</sub>CO<sub>3</sub>, CaCl<sub>2</sub>, CaO). The desiccant is regenerated in a **distillation** column from which the desiccant, water, and residual **azeotrope** are withdrawn sep.

IC C07C029-76; C07C045-79; C07C120-00

CC 48-1 (Unit Operations and Processes)  
 Section cross-reference(s): 2, 45, 51

ST **azeotrope** water removal desiccant

IT Silica gel, uses and miscellaneous

RL: USES (Uses)

(drying by, of **azeotrope**)

IT **Azeotropes and Azeotropy**

(drying of, by desiccants)

IT Drying

(of **azeotropes**, by desiccants)

IT Gasoline

RL: PROC (Process)

(gasohol, drying of, by desiccants)

IT 497-19-8, uses and miscellaneous 1305-78-8, uses and miscellaneous  
 1344-28-1, uses and miscellaneous 7757-82-6, uses and miscellaneous  
 7778-18-9 10043-52-4, uses and miscellaneous

RL: USES (Uses)

(drying by, of **azeotrope**)

IT 75-05-8P, preparation 78-93-3P, preparation

RL: PREP (Preparation)  
(drying of, desiccants for)  
IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(drying of, desiccants for)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 7 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1983:109287 HCAPLUS  
DN 98:109287  
TI Separation of an acetonitrile-water azeotrope  
IN Bala, Elena; Botez, Ligia F.  
PA Combinatul Petrochimic, Pitesti, Rom.  
SO Rom., 2 pp.  
CODEN: RUXXA3  
DT Patent  
LA Romanian  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 68241	B	19800815	RO 1976-86077	19760511
PRAI	RO 1976-86077	A	19760511		

AB The title azeotrope is separated by treatment with NaCl and CaCl<sub>2</sub> and fractional distillation to give MeCN [75-05-8] containing 0.2% water. Thus, 10.70 L 16:84 water-MeCN azeotrope was mixed with 300 g NaCl, and the aqueous NaCl was separated to give MeCN containing .apprx.5% water. This MeCN was mixed with 500 g CaCl<sub>2</sub> and the aqueous layer was separated to give 8.5 L MeCN containing .apprx.1% water, which was fractionated to give a distillate containing 5-15% water, leaving 7.3 L MeCN containing <0.3% water.

IC C07C121-18  
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
ST acetonitrile azeotrope drying; sodium chloride drying  
acetonitrile; calcium chloride drying acetonitrile

IT Drying  
(of acetonitrile-water azeotropes, with chloride salts and fractionation)

IT 75-05-8P, uses and miscellaneous  
RL: PREP (Preparation); USES (Uses)  
(drying of aqueous azeotropes, by chlorides with distn .)

IT 7647-14-5, uses and miscellaneous 10043-52-4, uses and miscellaneous  
RL: USES (Uses)  
(in drying of acetonitrile azeotropes)

IT 75-05-8P, uses and miscellaneous  
RL: PREP (Preparation); USES (Uses)  
(drying of aqueous azeotropes, by chlorides with distn .)

RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 8 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 1983:109284 HCAPLUS

DN 98:109284

TI Drying of acetonitrile

IN Matei, Gheorghe; Varvarichi, Viorel; Moga, Ana; Dobrin, Gheorghe

PA Combinatul Petrochimic, Pitesti, Rom.

SO Rom., 3 pp.  
CODEN: RUXXA3

DT Patent

LA Romanian

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 64553	B	19781115	RO 1974-77835	19740227
PRAI	RO 1974-77835	A	19740227		

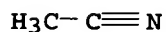
AB The MeCN [75-05-8] by-product from the ammoxidn. of propylene [115-07-1] to acrylonitrile (I) [107-13-1] was dried by an **azeotropic distillation**, in which I is added to the refluxing MeCN-water **azeotrope**, resulting in an I-MeCN-water **azeotrope** which has a b.p. much lower than the MeCN-water **azeotrope** and traps water in the top fraction of the **distillation**. This fraction is condensed and supercooled to give 2 phases, from which the organic phase is sent to the reflux zone of the **azeotropic distillation** and the aqueous phase is removed from the system, with MeCN being removed through a side valve. The resulting MeCN was 99.5% pure, and the process could be automated.

IC C07C121-18

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)  
Section cross-reference(s): 23, 35, 48ST acetonitrile drying **azeotropic distn**; acrylonitrile  
manuf acetonitrile byproduct drying; propylene ammoxidn acetonitrile  
byproduct dryingIT Drying  
(of acetonitrile, **azeotropic distillation** in,  
acrylonitrile additive in)IT Ammoxidation  
(of propylene, drying of acetonitrile by-product in)IT 115-07-1, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(ammoxidn. of, drying of acetonitrile by-product in)IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(drying of, **azeotropic distillation** in, acrylonitrile  
additive in)IT 107-13-1P, preparation  
RL: PREP (Preparation)  
(manufacture of, drying of acetonitrile by-product in)IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(drying of, **azeotropic distillation** in, acrylonitrile  
additive in)

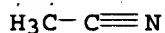
RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L16 ANSWER 9 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1980:471053 HCAPLUS  
DN 93:71053  
TI Acetonitrile from the acetonitrile-water azeotrope  
IN Bader, Dietmar; Nistor, Marian; Bader, Pia Camilla  
PA Combinatul Petrochimic Pitesti, Rom.  
SO Rom., 2 pp.  
CODEN: RUXXA3  
DT Patent  
LA Romanian  
FAN.CNT 1

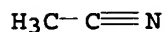
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 64887	B	19781215	RO 1972-69540	19720126
PRAI	RO 1972-69540	A	19720126		
AB	Azeotropes containing 15-20% H2O were distilled at 10-50 mm to give purified MeCN. Distillation of a MeCN-H2O azeotrope containing 17% H2O gave 78.3% MeCN of 94.5% purity.				
IC	C07C121-18				
CC	23-19 (Aliphatic Compounds)				
ST	acetonitrile water azeotrope distn				
IT	75-05-8P, preparation				
	RL: PREP (Preparation)				
	(separation of, from aqueous azeotropes)				
IT	75-05-8P, preparation				
	RL: PREP (Preparation)				
	(separation of, from aqueous azeotropes)				
RN	75-05-8 HCAPLUS				
CN	Acetonitrile (8CI, 9CI) (CA INDEX NAME)				



L16 ANSWER 10 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1978:190123 HCAPLUS  
DN 88:190123  
TI Separation of acetonitrile from its azeotropic mixture with water  
IN Ghidarcea, Ion; Nica, Ana; Chivulescu, Elena  
PA Combinatul Petrochimic Pitesti, Rom.  
SO Rom., 2 pp.  
CODEN: RUXXA3  
DT Patent  
LA Romanian  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	RO 60227	B	19760715	RO 1973-73933	19730222
PRAI	RO 1973-73933	A	19730222		
AB	HO(CH2CH2O)nH (n = 1, 2) were added to MeCN-water mixts. and glycol-water azeotropes were distilled				
IC	C07C121-18				
CC	23-19 (Aliphatic Compounds)				
ST	acetonitrile sepn aq mixt				
IT	75-05-8P, preparation				
	RL: PREP (Preparation)				
	(separation from aqueous mixts., by distillation of water-ethylene glycol				

azeotrope)  
 IT 75-05-8P, preparation  
 RL: PREP (Preparation)  
 (separation from aqueous mixts., by distillation of water-ethylene glycol  
 azeotrope)  
 RN 75-05-8 HCAPLUS  
 CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)



L16 ANSWER 11 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AN 1970:434837 HCAPLUS  
 DN 73:34837  
 TI Continuous separation of acrylonitrile and acetonitrile  
 IN Schoenbeck, Rupert; Krzemicki, Kasimir  
 PA Oesterreichische Stickstoffwerke A.-G.  
 SO Austrian, 5 pp.  
 CODEN: AUXXAK  
 DT Patent  
 LA German  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
AT 280235		19700410	AT	19680520

AB A process for the continuous separation of acrylonitrile (I) and acetonitrile (II) obtained in the reaction of propylene and NH<sub>3</sub> with O or air, by absorption of the H<sub>2</sub>O-soluble reaction products in H<sub>2</sub>O, comprises direct introduction of the absorption solution into an extraction-distillation with H<sub>2</sub>O as extracting agent, reclaiming of I free from II at the head of the extraction-distillation, removal of the fraction containing II from the lower part of the extraction-distillation column as side stream, and separation of the II azeotrope from the chief portion of the H<sub>2</sub>O in a stripping zone adjacent to the extraction distillation. The mixture to be separated is passed into the extraction-distillation in the upper half of the column which is preferably a bottom column, and the side stream containing II is branched off at least above the 10th bottom (from below) and preferably above the 15th bottom, whereby the part of the column below the branching is at most half of the total column. Between the inlet of the mixture to be separated and the branching of the side stream lie at least 3 and preferably at least 5 bottoms, and the amount of the side stream is so adjusted that in the sump of the extraction-distillation at least as much H<sub>2</sub>O, free from I and practically free from II, is obtained as is required at the head of the column as extraction H<sub>2</sub>O, which H<sub>2</sub>O is recycled to the head of the column after cooling, while the aqueous liquid obtained in the sump of the stripping column after removal of the main amount of II which contains ≥300 ppm. II is recycled into the absorption of the H<sub>2</sub>O-soluble reaction products of I synthesis. A flow diagram of the process is given.

IC C07C  
 CC 23 (Aliphatic Compounds)  
 ST acrylonitrile acetonitrile sepn continuous; acetonitrile acrylonitrile continuous sepn; sepn continuous acrylonitrile acetonitrile; nitriles acrylo aceto sepn  
 IT 107-13-1P, preparation  
 RL: PREP (Preparation)  
 (separation of, from acetonitrile)  
 IT 75-05-8P, preparation  
 RL: PREP (Preparation)



(separation of, from acrylonitrile)  
IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(separation of, from acrylonitrile)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 12 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1969:3320 HCAPLUS  
DN 70:3320  
TI Recovery of anhydrous acetonitrile from dilute aqueous solutions  
IN Anisimova, E. G.; Berlin, L. F.; Vinogradova, A. G.; Galata, L. A.;  
Kofman, L. S.; Svirskaya, K. I.; Chirikova, Z. P.; Martynova, Yu. N.  
PA State Design and Scientific-Research Institute of the Synthetic Rubber  
Industry  
SO U.S.S.R.  
From: Izobret., Prom. Obraztsy, Tovarnye Znaki 1968, 45(21), 22.  
CODEN: URXXAF  
DT Patent  
LA Russian  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	SU 220981		19680701	SU	19631110

AB Anhydrous MeCN is recovered from dilute aqueous solns. by **azeotropic distillation**. The solns. are first subjected to **azeotropic distillation** at atmospheric pressure or in vacuo; the resulting **azeotropic mixture** is the subjected to a repeated **azeotropic distillation** at 1-7 absolute atmospheric  
IC C07C  
CC 23 (Aliphatic Compounds)  
ST acetonitrile recovery  
IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(recovery of, by **azeotropic distillation**)  
IT 75-05-8P, preparation  
RL: PREP (Preparation)  
(recovery of, by **azeotropic distillation**)  
RN 75-05-8 HCAPLUS  
CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

L16 ANSWER 13 OF 13 HCAPLUS COPYRIGHT 2006 ACS on STN  
AN 1968:51783 HCAPLUS  
DN 68:51783  
TI **Distillation** of tetramethyl lead-acetonitrile with a thermal stabilizer  
IN Hannan, John F.  
PA du Pont de Nemours, E. I., and Co.  
SO U.S., 5 pp.  
CODEN: USXXAM

DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3362889	A	19680109	US 1966-529879	19660224
PRAI	US 1966-529879	A	19660224		

AB A method of stabilizing Me4Pb during distillation of Me4Pb-acetonitrile azeotropes, in which a thermal stabilizer is introduced sep. into the distillation unit is described. A feed containing Me4Pb 6, acetonitrile 69.2, H2O 5.3, and Et4NBr 19.5% was preheated to 65° and fed at 4 gal./hr. to the midpoint of a lagged 4 in. + 10 ft. 316 stainless steel column packed with 1/4-in. Intalox ceramic saddles and having 10 theoretical plates. Simultaneously, PhMe at 25° was fed at the top of the column at 0.5 lb/hr. The total feed was distilled at a reflux ratio of 10:1. The Me4Pb-poor upper layer of the distillate was recycled to the column while 2.5-3 lb./hr. Me4Pb-rich lower layer was recovered. The recovered distillate contained Me4Pb 76, PhMe 18, acetonitrile 5.5, and H2O 0.5%. The bottoms contained acetonitrile 69, H2O 6, Et4NBr 26%, and no detectable Me4Pb.

INCL 203006000

CC 51 (Petroleum, Petroleum Derivatives, and Related Products)

ST DISTN TETRAMETHYLLEAD; ANTIKNOCK COMPDS STABILIZERS; GASOLINE. ANTIKNOCK COMPDS; TETRAMETHYLLEAD DISTN; FUELS ANTIKNOCK COMPDS STABILIZERS

IT 108-88-3, uses and miscellaneous  
RL: USES (Uses)  
(as stabilizer, thermal, for tetramethyl lead-acetonitrile azeotropic distillation)

IT 75-74-1P  
RL: PREP (Preparation)  
(azeotropic distillation of acetonitrile-, thermal stabilizers for, toluene as)

IT 75-05-8P, uses and miscellaneous  
RL: PREP (Preparation); USES (Uses)  
(azeotropic distillation of tetramethyl lead-, thermal stabilizer in, toluene as)

IT 75-05-8P, uses and miscellaneous  
RL: PREP (Preparation); USES (Uses)  
(azeotropic distillation of tetramethyl lead-, thermal stabilizer in, toluene as)

RN 75-05-8 HCAPLUS

CN Acetonitrile (8CI, 9CI) (CA INDEX NAME)

H<sub>3</sub>C-C≡N

=>